

UNESCO INSTITUTE *for* STATISTICS

Education Indicators

Technical Guidelines

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TABLE OF CONTENTS

ADULT LITERACY OR ILLITERACY RATES.....	3
NUMBER OF ADULT ILLITERATES.....	4
APPARENT INTAKE RATE.....	5
NET INTAKE RATE.....	6
SCHOOL-LIFE EXPECTANCY.....	7
TRANSITION RATES.....	8
GROSS ENROLMENT RATIO.....	9
NET ENROLMENT RATIO.....	10
AGE SPECIFIC ENROLMENT RATIO.....	12
REPETITION RATES.....	13
SURVIVAL RATES BY GRADE.....	14
COEFFICIENT OF EFFICIENCY.....	15
YEARS-INPUT PER GRADUATE.....	17
PERCENTAGE OF REPEATERS.....	18
PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF GROSS NATIONAL PRODUCT.....	19
PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF TOTAL GOVERNMENT EXPENDITURE.....	20
PERCENTAGE DISTRIBUTION OF PUBLIC CURRENT EXPENDITURE ON EDUCATION BY LEVEL.....	21
PUBLIC CURRENT EXPENDITURE PER PUPIL (STUDENT) AS % OF GNP PER CAPITA.....	22
PUPIL-TEACHER RATIO.....	23
PERCENTAGE OF FEMALE TEACHERS.....	24
PERCENTAGE OF STUDENTS IN TERTIARY EDUCATION BY ISCED LEVEL.....	25
PERCENTAGE OF FEMALE STUDENTS IN EACH ISCED LEVEL OF TERTIARY EDUCATION.....	26
STUDENTS IN TERTIARY EDUCATION BY ISCED FIELDS OF EDUCATION.....	27
PERCENTAGE DISTRIBUTION OF GRADUATES BY ISCED FIELDS OF EDUCATION IN TERTIARY EDUCATION.....	28
PERCENTAGE OF PRIVATE ENROLMENT.....	29
PERCENTAGE TEACHING STAFF IN PRIVATE EDUCATIONAL INSTITUTION.....	30
EDUCATIONAL ATTAINMENT OF THE POPULATION AGED 25 YEARS AND ABOVE.....	31
NUMBER OF STUDENTS IN TERTIARY EDUCATION PER 100,000 INHABITANTS.....	32
ENROLMENT IN SECONDARY EDUCATION BY TYPE OF EDUCATION.....	33
PUBLIC CURRENT EXPENDITURE ON EDUCATION AS PERCENTAGE OF TOTAL PUBLIC EXPENDITURE ON EDUCATION.....	34
TEACHERS' EMOLUMENTS AS PERCENTAGE OF PUBLIC CURRENT EXPENDITURE ON EDUCATION.....	35
PERCENTAGE OF STUDENTS IN TERTIARY EDUCATION BY ISCED LEVEL.....	36

ADULT LITERACY OR ILLITERACY RATES.

Definition: Adult literacy rate is defined as the percentage of population aged 15 years and over who can both read and write with understanding a short simple statement on his/her everyday life. Adult illiteracy is defined as the percentage of the population aged 15 years and over who cannot both read and write with understanding a short simple statement on his/her everyday life.

Purpose: Adult literacy rate shows the accumulated achievement of primary education and literacy programmes in imparting basic literacy skills to the population, thereby enabling them to apply such skills in daily life and to continue learning and communicating using the written word. Literacy represents a potential for further intellectual growth and contribution to economic-socio-cultural development of society. Illiteracy rates indicate the extent of need for policies and efforts in organizing adult literacy programmes and quality primary education.

Calculation method: Divide the number of literates by the corresponding age-group population and multiply the result by 100. Alternatively, apply the same method using the number of illiterates to derive the illiteracy rate ; or by subtracting literacy rate from 100%.

Formula:

$$LIT_{15+}^t = \frac{L_{15+}^t}{P_{15+}^t} * 100 \quad \text{or} \quad ILL_{15+}^t = \frac{I_{15+}^t}{P_{15+}^t} * 100$$

Where:

LIT_{15+}^t = Adult Literacy Rate (15+) in year t

ILL_{15+}^t = Adult Illiteracy Rate (15+) in year t

L_{15+}^t = Adult Literate Population (15+) in year t

I_{15+}^t = Adult Illiterate Population (15+) in year t

P_{15+}^t = Adult Population (15+) in year t

$$LIT_{15+}^t + ILL_{15+}^t = 100\%$$

Data required: Population and number of literates (or illiterates) aged 15 years and over.

Data source: Mainly National population census ; household and/or labour force surveys.

Types of disaggregation: This indicator is to be calculated by gender, geographical location (region, urban/rural) and by the following five-year age-groups: 15-19; 20-24; 25-29; 30-34; 35-39; 40-44; 45-49; 50-54; 55-59; 60-64; 65 and above.

Interpretation: High literacy rate (or low illiteracy rate) indicates a wide coverage of the primary education system and/or literacy programmes in that a large proportion of the population have acquired the ability of using the written word in daily life and to continue learning. It is common practice to present and analyse literacy rates together with the absolute **number of adult illiterates** as improvements in literacy rates may sometimes be accompanied by increases in the illiterate population due to the changing demographic structure.

Quality standards: It will be useful to align measurements of literacy with the standard international definition given above, and to administer literacy tests on a sample basis to verify and improve the quality of literacy statistics.

Limitations: It has been observed that some countries apply definitions and criteria for literacy which are different from the international standards defined above, or equate persons with no schooling to illiterates, or change definitions between censuses. Practices for identifying literates and illiterates during actual census enumeration may also vary, as well as errors in literacy self-declaration can affect the reliability of literacy statistics.

NUMBER OF ADULT ILLITERATES.

Definition: The population aged 15 years and above who cannot both read and write with understanding a short simple statement on their every day life.

Purpose: The purpose of this indicator is to identify the size and if possible also the whereabouts and characteristics of the illiterate population aged 15 years and above who should be targeted for policies and efforts in expanding adult literacy programmes.

Calculation method: Either use data on the number of adult illiterates collected during population census or survey or subtract the number of adult literates from the total population aged 15 years and above.

Data required: Population and number of illiterates aged 15 years and above by sex.

Data sources: Population census, household, fertility and labour force surveys.

Type of disaggregation: This indicator is to be calculated by sex, geographical location, (region, rural/urban areas) and by the following five-year age-groups : 15-19, 20-24, 25-29, ..., 60-64, 65 and above.

Interpretation: The higher the illiterate population of the country, the more the need for expanding primary education and adult literacy programmes. When disaggregated by geographical locations, it can pinpoint the areas needing most literacy efforts, and policies may be set to target such efforts at priority population groups of a particular gender and age-group(s).

Quality standards: It will be useful to align all measurements of literacy with the standard international definition and to administer literacy tests on sample basis to verify and improve the quality of literacy statistics.

Limitations: It has been observed that some countries apply definitions and criteria of literate (illiterate) which are different from the international standards or equate persons with no schooling as illiterates. Practices for identifying literates and illiterates during actual census enumeration may also vary, as well as errors in literacy self-declaration can also affect the reliability of literacy statistics.

APPARENT INTAKE RATE

Definition: Total number of new entrants in the first grade of primary education, regardless of age, expressed as a percentage of the population at the official primary school-entrance age.

Purpose: Apparent Intake Rate indicates the general level of access to primary education. It also indicates the capacity of the education system to provide access to grade 1 for the official school-entrance age population. This indicator is used as a substitute to Net Intake Rate (NIR) in the absence of data on new entrants by single years of age.

Calculation method: Divide the number of new entrants in grade 1, irrespective of age, by the population of official school-entrance age, and multiply the result by 100.

Formula:

$$AIR^t = \frac{N^t}{P_a^t} * 100$$

Where:

AIR^t = Apparent Intake Rate in school-year t

N^t = Number of new entrants in the first grade of primary education, in school-year t

P_a^t = Population of official primary school entrance-age a , in school-year t .

N.B.: When data on new entrants are not separately reported, they can be derived by subtracting the number of repeaters from enrolment in the first grade, before calculating the apparent intake rate.

Data required: New entrants in the first grade of primary education (or enrolment minus repeaters in the first grade); population of the official primary school-entrance age.

Data source: School register, school survey or census for data on new entrants by age. Population census or estimates for primary school-entrance age population.

Type of disaggregation: The Apparent Intake Rate is to be disaggregated by gender and by geographical location (region, rural/urban).

Interpretation: A high Apparent Intake Rate indicates a high degree of access to primary education. As this calculation includes all new entrants to first grade (regardless of age), the Apparent Intake Rate can be more than 100%, due to over-aged and under-aged children entering primary school for the first time.

Quality standards: Data on population used in deriving this indicator should refer strictly to the official school-entrance age. Care should be taken not to include repeaters in grade 1 in the calculation, since this will lead to an inflated Apparent Intake Rate.

Limitations: A high Apparent Intake Rate may be the effect of a backlog of over-aged children who have not entered school when they were at the official primary school-entrance age.

NET INTAKE RATE

Definition: New entrants in the first grade of primary education who are of the official primary school-entrance age, expressed as a percentage of the population of the same age.

Purpose: To show the level of access to primary education of the eligible population of primary school-entrance age.

Calculation method: Divide the number of children of official primary school-entrance age who enter the first grade of primary education by the population of the same age, and multiply the result by 100.

Formula:

$$\text{NIR}^t = \frac{N_a^t}{P_a^t} * 100$$

Where:

NIR^t = Net Intake Rate in school-year t .

N_a^t = Number of children of official primary school-entrance age a who enter the first grade of primary education, in school-year t .

P_a^t = Population of official primary school-entrance age a , in school-year t .

Data required: New entrants in first grade of primary education by single years of age; population of official primary school-entrance age.

Data source: School register, school survey or census for data on new entrants by age. Population census or estimates for school-entrance age population.

Type of disaggregation: The Net Intake Rate is to be disaggregated by gender and by geographical location (region, rural/urban).

Interpretation: A high Net Intake Rate indicates a high degree of access to primary education for the official primary school-entrance age children. For countries which have subscribed to the policy goal of universal primary education, a NIR of 100% will be a necessary condition.

Quality standards: Data on both new entrants and population used in deriving this indicator should refer strictly to the official school-entrance age. NIR in principle should not exceed 100%.

Limitations: This indicator can be distorted by an incorrect distinction between new entrants and repeaters in the first grade. This can be the case especially for under-aged pupils who may repeat the first grade at the official-entrance age.

SCHOOL-LIFE EXPECTANCY

Definition: School life expectancy is defined as the total number of years of schooling which a child of a certain age can expect to receive in the future, assuming that the probability of his or her being enrolled in school at any particular age is equal to the current enrolment ratio for that age.

Purpose: This indicator shows the overall level of development of an educational system in terms of the number of years of education that a child can expect to achieve.

Calculation method: For a child of a certain age **a**, the school life expectancy is calculated as the sum of the **age specific enrolment ratios** for the reference age-range **a** to **n**.

Formula:

$$SLE_a^t = \sum_{i=a}^n \frac{E_i^t}{P_i^t}$$

Where:

SLE_a^t = School life expectancy at an age **a** in year **t**

E_i^t = Enrolment of the population of age **i** (for **i = a, a+1, ..., n**) in school-year **t**; **n** denotes the theoretical upper age-limit of schooling.

P_i^t = Population of age **i** in school-year **t**

Data required: Enrolment by age at all levels of education; population of official school-age for all levels of education by single years of age. Or, alternatively, the age specific enrolment ratios for all levels of education.

Data source: School register, school survey or census for data on enrolment by age. Population censuses and estimates for school-age population.

Type of disaggregation: School life expectancy is to be disaggregated by gender and by geographical location (region, urban/rural).

Interpretation: Relatively higher school life expectancy indicates greater probability for children to spend more years in education and higher overall retention within the education system. It must be noted that the expected number of years does not necessarily coincide with the expected number of grades of education completed, because of grade repetition.

Quality standards: School life expectancy requires complete and reliable data on enrolment and population by single-years of age corresponding to all levels of education for the entire duration of schooling, including tertiary education.

Limitations: Caution is required when school life expectancy is used for inter-country comparison; neither the length of the school-year nor the quality of education is necessarily the same in each country. In addition, as this indicator does not directly take into account the effects of repetition, it is not strictly comparable between countries with automatic promotion and those allowing grade repetition. It should also be noted that, depending on countries, the enrolment data do not account for many types of continuing education and training. For these reasons, this indicator should be interpreted in the light of complementary indicators, particularly **percentage of repeaters**.

TRANSITION RATES

Definition: The number of pupils (or students) admitted to the first grade of a higher level of education in a given year, expressed as a percentage of the number of pupils (or students) enrolled in the final grade of the lower level of education in the previous year.

Purpose: This indicator conveys information on the degree of access or transition from one cycle or level of education to a higher one. Viewed from the lower cycle or level of education, it is considered as an output indicator, viewed from the higher educational cycle or level, it constitutes an indicator of access. It can also help in assessing the relative selectivity of an education system, which can be due to pedagogical or financial requirements.

Calculation method: Divide the number of new entrants in the first grade of the specified higher cycle or level of education by the number of pupils who were enrolled in the final grade of the preceding cycle or level of education in the previous school year, and multiply by 100.

Formula:

$$TR_{h,h+1}^t = \frac{E_{h+1,1}^{t+1} - R_{h+1,1}^{t+1}}{E_{h,n}^t} * 100$$

Where :

$TR_{h,h+1}^t$ = Transition rate (from cycle or level of education **h** to **h+1** in school year **t**)

$E_{h+1,1}^{t+1}$ = number of pupils enrolled in the **first** grade at level of education **h+1** in school-year **t+1**

$R_{h+1,1}^{t+1}$ = number of pupils repeating the **first** grade at level of education **h+1** in school-year **t+1**

$E_{h,n}^t$ = number of pupils enrolled in **final** grade **n** at level of education **h** in school year **t**.

Data required: Enrolment in the final grade of a given cycle or level of education and new entrants to (or enrolment minus repeaters) the first grade of the higher cycle or level of education.

Data source: School register, school survey or census.

Data disaggregation: Transition rate is to be disaggregated by gender, level of education and geographical location (region, rural/urban).

Interpretation: High transition rates indicate a high level of access or transition from one level of education to the next. They also reflect the intake capacity of the next level of education. Inversely, low transition rates can signal problems in the bridging between two cycles or levels of education, due to either deficiencies in the examination system, or inadequate admission capacity in the higher cycle or level of education, or both.

Quality standards: This indicator should be based on reliable data on new entrants (or on enrolment and repeaters) especially in the first grade of the higher cycle or level of education.

Limitations: This indicator can be distorted by incorrect distinction between new entrants and repeaters, especially in the first grade of the specified higher level of education. Students who interrupted their studies for one or more years after having completed the lower level of education, together with the migrant students could also affect the quality of this indicator.

GROSS ENROLMENT RATIO

Definition: Total enrolment in a specific level of education, regardless of age, expressed as a percentage of the eligible official school-age population corresponding to the same level of education in a given school-year.

Purpose: Gross Enrolment Ratio is widely used to show the general level of participation in a given level of education. It indicates the capacity of the education system to enrol students of a particular age-group. It is used as a substitute indicator to net enrolment ratio (**NER**) when data on enrolment by single years of age are not available. Furthermore, it can also be a complementary indicator to NER by indicating the extent of over-aged and under-aged enrolment.

Calculation method: Divide the number of pupils (or students) enrolled in a given level of education regardless of age by the population of the age-group which officially corresponds to the given level of education, and multiply the result by 100.

Formula:

$$GER_h^t = \frac{E_h^t}{P_{h,a}^t} * 100$$

Where:

GER_h^t = Gross Enrolment Ratio at level of education **h** in school-year **t**

E_h^t = Enrolment at the level of education **h** in school-year **t**

$P_{h,a}^t$ = Population in age-group **a** which officially corresponds to the level of education **h** in school-year **t**

Example: If the entrance age for primary education is 7 years with a duration of 6 years then **a** is (7-12) years.

Data required: Total enrolment for a given level of education. Population of the age-group corresponding to the specified level.

Data source: School register, school survey or census for data on enrolment by level of education. Population censuses or estimates for school-age population normally obtained from the Central Statistical Office.

Types of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural) and by level of education.

Interpretation: A high GER generally indicates a high degree of participation, whether the pupils belong to the official age-group or not. A GER value of 100 percent indicates that a country is, in principle, able to accommodate all of its school-age population, but it does not indicate the proportion already enrolled. The achievement of a GER of 100 percent is therefore a necessary but not sufficient condition for enrolling all eligible children in school. When the GER exceeds 90 percent for a particular level of education, the aggregate number of places for pupils is approaching the number required for universal access of the official age-group. However, this is a meaningful interpretation only if one can expect the under-aged and over-aged enrolments to decline in the future to free places for pupils from the expected age-group.

Quality standards: GER at each level of education should be based on total enrolment in all types of schools and education institutions, including public, private and all other institutions that provide organised educational programmes.

Limitations: GER can be over 100% due to the inclusion of over-aged and under-aged pupils/students because of early or late entrants, and grade repetition. In this case, a rigorous interpretation of GER needs additional information to assess the extent of repetition, late entrants, etc.

NET ENROLMENT RATIO

Definition: Enrolment of the official age-group for a given level of education expressed as a percentage of the corresponding population.

Purpose: To show the extent of participation in a given level of education of children and youths belonging to the official age-group corresponding to the given level of education.

Calculation method: Divide the number of pupils enrolled who are of the official age-group for a given level of education by the population for the same age-group and multiply the result by 100.

Formula:

$$NER_h^t = \frac{E_{h,a}^t}{P_{h,a}^t} * 100$$

Where:

NER_h^t = Net Enrolment Ratio at level of education **h** in school-year **t**

$E_{h,a}^t$ = Enrolment of the population of age-group **a** at level of education **h** in school-year **t**

$P_{h,a}^t$ = Population in age-group **a** which officially corresponds to level of education **h** in school-year **t**

Example: If the entrance age for primary education is 7 years with a duration of 6 years then **a** is (7-12) years.

Data required: Enrolment by single years of age for a given level of education. Population of the age-group corresponding to the given level of education.

Data source: School register, school survey or census for data on enrolment by age. Population censuses or estimates for school-age population normally obtained from the Central Statistical Office.

Types of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural) and by level of education.

Interpretation: A high NER denotes a high degree of participation of the official school-age population. The theoretical maximum value is 100%. Increasing trends can be considered as reflecting improving participation at the specified level of education. When the NER is compared with the GER the difference between the two ratios highlights the incidence of under-aged and over-aged enrolment. If the NER is below 100%, then the complement, i.e. the difference with 100% provides a measure of the proportion of children not enrolled at the specified level of education. However, since some of these children/youth could be enrolled at other levels of education, this difference should in no way be considered as indicating the percentage of students not enrolled. A more precise complementary indicator is the age-specific enrolment ratio (**ASER**) which shows the participation of the population of a particular age in education.

Quality standards: NER at each level of education should be based on total enrolment in all types of schools and education institutions, including public, private and all other institutions that provide organized educational programmes.

Limitations: For tertiary education, this indicator is not pertinent because of the difficulties in determining an appropriate age-group due to the wide variations in the duration of programmes at this level of education. As regards primary and secondary education, certain difficulties arise when calculating the NER for countries where the net enrolment ratios should be of the order of 100%. Three cases can be mentioned:

1. when the reference date for entry to primary education does not coincide with the birthdays of all of the cohort eligible to enrol at this level of education.
2. when an important part of the population starts primary school earlier than the prescribed

age and consequently finishes earlier as well.

3. when there is an increase in the entrance age to primary education with the durations unchanged.

N.B. Although the NER cannot exceed 100%, values up to 105% have been obtained and in these cases there are inconsistencies in the enrolment and/or population data.

AGE SPECIFIC ENROLMENT RATIO

Definition: Percentage of the population of a specific age enrolled, irrespective of the level of education.

Purpose: To show the extent of the participation of a specific age cohort in educational activities.

Calculation method: Divide the number of pupils (or students) of a specific age enrolled in educational institutions at all levels of education by the population of the same age and multiply the result by 100.

Formula:

$$ASER_a^t = \frac{E_a^t}{P_a^t} * 100$$

Where :

$ASER_a^t$ = Age Specific Enrolment Ratio of the population of age **a** in school-year **t**

E_a^t = Enrolment of the population of age **a** in school-year **t**.

P_a^t = Population of age **a** in school-year **t**

N.B. This method may also be used separately to calculate ASER by individual levels of education. The calculation is the same, the sole difference being that the enrolment refers only to one level of education, for example primary education.

Data required: Enrolment by single years of age. Population of the corresponding age.

Data source: School register, school survey or census for data on enrolment by age. Population censuses or estimates for single year school-age population normally obtained from the Central Statistical Office.

Types of disaggregation: This indicator is to be disaggregated by gender, geographical location (region, urban/rural) and by level of education.

Interpretation: A high ASER denotes a high degree of educational participation of the population of the particular age. The theoretical maximum value is 100%. Increasing trends can be considered as reflecting improving participation of the particular age.

If the ASER is below 100%, then the complement, i.e. the difference with 100% provides a measure of the proportion of the population of the particular age who are not enrolled.

Quality standards: ASER at each level of education should be based on total enrolment in all types of schools and education institutions, including public, private and all other institutions that provide organised educational programmes. The enrolment and population data should refer to the same date. Further, it must be ensured that the enrolment data covers all levels of education to avoid excluding some members of the age cohort.

Limitations: This indicator does not give an indication of the grade or the level of education in which pupils or students are enrolled.

REPETITION RATES

Definition: Proportion of pupils from a cohort enrolled in a given grade at a given school-year who study in the same grade in the following school-year.

Purpose: It measures the phenomenon of pupils from a cohort repeating a grade, and its effect on the internal efficiency of educational systems. In addition, it is one of the key indicators for analysing and projecting pupil flows from grade to grade within the educational cycle.

Calculation method: Divide the number of repeaters in a given grade in school-year **t+1** by the number of pupils from the same cohort enrolled in the same grade in the previous school-year **t**.

Formula:

$$r_i^t = \frac{R_i^{t+1}}{E_i^t}$$

Where:

r_i^t = Repetition Rate at grade **i** in school-year **t**

R_i^{t+1} = number of pupils repeating grade **i**, in school-year **t+1**

E_i^t = number of pupils enrolled in grade **i**, in school-year **t**.

Data required: Enrolment by grade for school-year **t** and number of repeaters from the same cohort by grade for year **t+1**.

Data source: School register, school survey or census for data on enrolment and repeaters by grade.

Type of disaggregation: Repetition Rate can be disaggregated by grade, by sex, by geographical location (regions, urban/rural), by level of education and by type of institution (public/private).

Interpretation: Repetition Rate ideally should approach zero percent; a high repetition rate reveals problems in the internal efficiency of the educational system. When compared across grades, the patterns can indicate specific grades for which there is higher repetition, hence requiring more in depth study of causes and possible remedies.

Quality standard: Like other pupil-flow rates (promotion and drop-out rates), the repetition rate is derived by analysing data on enrolment and repeaters by grade for two consecutive years. One should therefore ensure that such data are consistent in terms of coverage over time and across grades. Special attention should also be paid to minimizing some common errors which may bias these flow-rates, such as: Over-reporting enrolment/repeaters (particularly in grade one); incorrect distinction between new entrants and repeaters; transfers of pupils between grades and schools.

Limitations: The level and maximum number of grade repetitions allowed can in some cases be determined by the educational authorities with the aim of coping with limited grade capacity and increasing the **internal efficiency** and flow of pupils (or students). Care should be taken in interpreting this indicator, especially in comparisons between education systems.

SURVIVAL RATES BY GRADE

Definition: Percentage of a cohort of pupils (or students) enrolled in the first grade of a given level or cycle of education in a given school-year who are expected to reach successive grades.

Purpose: Survival rate measures the holding power and **internal efficiency** of an education system. It illustrates the situation regarding retention of pupils (or students) from grade to grade in schools, and conversely the magnitude of drop-out by grade.

Calculation method: Divide the total number of pupils belonging to a school-cohort who reached each successive grade of the specified level of education by the number of pupils in the school-cohort i.e. those originally enrolled in the first grade of primary education, and multiply the result by 100.

Formula:

$$SR_{g,i}^k = \frac{\sum_{t=1}^m P_{g,i}^t}{E_g^k} * 100 \quad \text{Where: } P_{g,i}^t = E_{g,i+1}^{t+1} - R_{g,i+1}^{t+1}$$

i = grade (1, 2, 3, ..., n) t = year (1, 2, 3, ..., m) g = pupil-cohort.

$SR_{g,i}^k$ = Survival Rate of pupil-cohort g at grade i for a reference year k

E_g^k = Total number of pupils belonging to a cohort g at a reference year k

$P_{g,i}^t$ = Promotees from E_g^k who would join successive grades i throughout successive years t .

R_i^t = Number of pupils repeating grade i in school-year t .

Data required: Enrolment by grade for two consecutive years (years t and $t+1$); number of repeaters by grade for year $t+1$.

Data source: School register, school survey or census.

Type of disaggregation: Survival Rates can be disaggregated by gender, by geographical location (region, urban/rural) and by type of institution (private/public). It can also be disaggregated between survival with and without repetition.

Interpretation: Survival Rate approaching 100% indicates a high level of retention and low incidence of drop-out. Survival Rate may vary from grade to grade, giving indications of grades with relatively more or less drop-outs. The distinction between survival rate with and without repetition is necessary to compare the extent of wastage due to drop-out and repetition. Survival rate to grade 5 of primary education is of particular interest since this is commonly considered as pre-requisite for sustainable literacy.

Quality standards: Since the calculation of this indicator is based on pupil-flow rates, the reliability of the Survival Rate depends on the consistency of data on enrolment and repeaters in term of coverage over time and across grades.

Limitations: Given that this indicator is usually estimated using **cohort analysis** models that are based on a number of assumptions, care should be taken in using of the results in comparisons.

COEFFICIENT OF EFFICIENCY

Definition: The ideal (optimal) number of pupil-years required (i.e. in the absence of repetition and drop-out) to produce a number of graduates from a given school-cohort for a cycle or level of education expressed as a percentage of the actual number of pupil-years spent to produce the same number of graduates. Input-output ratio, which is the reciprocal of the coefficient of efficiency, is often used as an alternative. N.B. One school-year spent in a grade by a pupil is counted as one pupil-year.

Purpose: This is a synthetic indicator of the internal efficiency of an educational system. It summarises the consequences of repetition and drop-out on the efficiency of the educational process in producing graduates.

Calculation method: Divide the ideal number of pupil-years required to produce a number of graduates from a given school-cohort for the specified level of education, by the actual number of pupil-years spent to produce the same number of graduates, and multiply the result by 100.

Formula:

$$CE_g = \frac{\sum_{j=n}^{n+k} G_{g,j} * n}{\left\{ \sum_{j=n}^{n+k} G_{g,j} * j \right\} + \left\{ \sum_{j=1}^{n+k} D_{g,j} * j \right\}} * 100$$

For more details, see the flow diagram on **cohort analysis**.

Where:

CE_g = Coefficient of Efficiency for a pupil-cohort g

$G_{g,n}$ = the number of pupils graduating from cohort g in final grade n after n years of study (without repetition)

$G_{g,j}$ = the number of pupils graduating from cohort g in final grade n after j years of study

$D_{g,j}$ = the number of pupils (of the cohort g) dropping out after j years of study

k denotes the number of repetitions allowed; n the prescribed normal duration of study for a cycle or level of education; g the pupil-cohort; and j the number of years of study.

Data required: Number of graduates and drop-outs by length of study. These data can also be derived using the reconstructed cohort model, which requires enrolment by grade for two consecutive years (years t and $t+1$); number of repeaters by grade for year $t+1$ and number of graduates for year t .

Data source: School register, school survey or census for data on repeaters and enrolment.

Type of disaggregation: The Coefficient of Efficiency can be disaggregated by gender, by geographical location (region, urban/rural) and by school type (private/public).

Interpretation: A Coefficient of Efficiency approaching 100% indicates a high overall level of internal efficiency and no wastage due to repetition and drop-out. Coefficient of Efficiency of less than 100% signals inefficiency due to grade repetition and drop-out. As the reciprocal, the optimum input-output ratio is unity i.e. 1, and inefficiency arises from any point which is greater than one.

Quality standards: Since the calculation of this indicator is based on pupil-flow rates, its reliability depends on the consistency of data on enrolment and repeaters in term of coverage over time and across grades. Differences in national regulations concerning the number of repetitions allowed constitute an aspect to be taken into account when using this indicator for inter-country comparisons.

Limitations: Given that this indicator is usually derived using cohort analysis models that are based on a number of assumptions, and owing to the highly synthetic nature of this indicator, care should be taken in the use of the results in

comparing education systems. From a conceptual viewpoint, having most pupils (or students) graduating within the prescribed duration of the cycle is optimal with regard to economic efficiency and resource utilization, but this does not necessarily imply achievement of the expected learning outcomes. Also, according to this calculation method, early drop-outs (i.e. from lower grades) can result in higher internal efficiency than late drop-out (i.e. from higher grades); this means that efficiency from the economic point of view can be in contradiction with educational objectives aiming at retaining pupils in schools until higher grades when they would have acquired the desired knowledge and skills.

YEARS-INPUT PER GRADUATE

Definition: The estimated average number of pupil-years spent by pupils (or students) from a given cohort who graduate from a given cycle or level of education, taking into account the pupil-years wasted due to drop-out and repetition. N.B. One school-year spent in a grade by a pupil is equal to one pupil-year.

Purpose: To assess the extent of educational **internal efficiency** in terms of the estimated average number of years to be invested in producing a graduate.

Calculation method: Divide the total number of pupil-years spent by a pupil-cohort (graduates plus drop-outs) in the specified level of education by the sum of successive batch of graduates belonging to the same cohort.

Formula:

$$YIG_g = \frac{\left\{ \sum_{j=n}^{n+k} G_{g,j} * j \right\} + \left\{ \sum_{j=1}^{n+k} D_{g,j} * j \right\}}{\sum_{j=n}^{n+k} G_{g,j}}$$

For more details, see the flow diagram on **cohort analysis**

Where:

YIG_g = Years input per graduate (for graduates belonging to cohort g)

$G_{g,j}$ = Graduates from cohort g after j years of study

$D_{g,j}$ = drop-outs from cohort g after j years of study

k denotes the number of repetitions allowed; n the prescribed normal duration of study for a cycle or level of education; g the pupil-cohort; and j the number of years of study.

Data required: Total number of pupil-years spent by the pupil-cohort and the total number of graduates from the same cohort. These data can be derived using cohort reconstructed model, which requires enrolment by grade for two consecutive years (years t and $t+1$); number of repeaters by grade for year $t+1$ and number of graduates for year t .

Data source: School register, school survey, census or records.

Type of disaggregation: The years input per graduate can be disaggregated by gender, by geographical location (region, urban/rural) and by type of institution (private/public).

Interpretation: The closer the value of this indicator is to the theoretical number of grades (or duration) of the specified education cycle, the higher the internal efficiency and the lesser the negative effects of repetition and drop-out. A high number of pupil-years per graduate as compared to the normal duration, denotes waste of resources and hence inefficiency.

Quality standards: Since the calculation of this indicator is based on pupil-flow rates, its reliability depends on the consistency of data on enrolment and repeaters in term of coverage over time and across grades. Differences in national regulations concerning the number of repetitions allowed constitute an aspect to be taken into account when using this indicator for inter-country comparisons.

Limitations: From a conceptual viewpoint, having most pupils (or students) graduating within the prescribed duration of the cycle is optimal with regard to economic efficiency and resource utilization, but this does not necessarily imply achievement of the expected learning outcomes. Also, according to this calculation method, early drop-outs (i.e. from lower grades) can result in higher internal efficiency than late drop-out (i.e. from higher grades); this means that efficiency from the economic point of view can be in contradiction with educational objectives aiming at retaining pupils in schools until higher grades when they would have acquired the desired knowledge and skills.

PERCENTAGE OF REPEATERS

Definition: Total number of pupils who are enrolled in the same grade as in a previous year, expressed as a percentage of the total enrolment to the specified grade.

Purpose: This indicator measures the extent and patterns of repetition by grade, as part of the internal efficiency of education system.

Calculation method: Divide the number of pupils/students repeating a given grade in a given school-year by the number of pupils or students enrolled in the same grade in the same school-year and multiply by 100.

Formula:

$$PR_i^t = \frac{R_i^t}{E_i^t} * 100$$

Where :

PR_i^t = percentage of repeaters in grade *i*, in school-year *t*

R_i^t = number of pupils repeating grade *i* in school-year *t*

E_i^t = number of pupils enrolled in grade *i*, in school-year *t*.

Data required: Number of repeaters and enrolment by grade for the same school-year.

Data source: School register, school census or surveys for data on repeaters and enrolment by grade.

Types of disaggregation: This indicator is to be calculated by gender, geographical location (region, rural/urban areas) and level of education.

Interpretation: Ideally percentage of repeaters should be zero percent indicating absence of grade repetition. Higher PR means there are serious problems of grade repetition, hence of internal efficiency of the education system.

Quality standards: The definition of repeaters above should be unambiguously applied to include even pupils or students repeating more than once in the same grade and those who repeat the same grade while transferring from one school to another. Pupils or students who were not studying in the same grade in the previous year should be excluded, for example, those who were in a higher or lower grade.

Limitations: The level and maximum number of grade repetitions allowed can in some cases be determined by the educational authorities with the aim of coping with limited grade capacity and increasing the **internal efficiency** and flow of pupils (or students). Care should be taken in interpreting this indicator, especially in comparisons between education systems.

PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF GROSS NATIONAL PRODUCT

Definition: Total public expenditure on education (current and capital) expressed as a percentage of the Gross National Product (GNP) in a given financial year.

Purpose: This indicator shows the proportion of a country's wealth generated during a given financial year that has been spent by government authorities on education.

Calculation method: Divide total public expenditure on education in a given financial year by the GNP of the country for the corresponding year and multiply by 100.

Formula:

$$\% \text{XGNP}_t = \frac{\text{PXE}_t}{\text{GNP}_t} * 100$$

Where :

$\% \text{XGNP}_t$ = Percentage public expenditure on education in financial year t .

PXE_t = Total Public expenditure on Education in financial year t .

GNP_t = Gross National Product in financial year t .

Data required: Total public expenditure on education and the Gross National Product for a given financial year.

Data sources: Annual financial reports by central or federal governments, state or provincial or regional administrations. Data on GNP are normally available from National Accounts reports from the Bureau of Statistics.

Type of disaggregation: This indicator is normally calculated at the national level only.

Interpretation: In principle a high percentage of GNP devoted to public expenditure on education denotes a high level of attention given to investment in education by the government; and vice versa.

Quality standards: Total public expenditure on education should include those incurred by all concerned ministries and levels of administration. Total public expenditure on education refers to all expenditure on education by the central or federal government, state governments, provincial or regional administrations and expenditure by municipal and other local authorities. Central government includes ministerial departments, agencies and autonomous institutions which have education responsibilities. The statistics on expenditure should cover transactions made by all departments or services with education responsibility at all decision-making levels.

Limitations: In some instances data on total public expenditure on education refers only to the Ministry of Education, excluding other ministries that spend a part of their budget on educational activities.

PUBLIC EXPENDITURE ON EDUCATION AS PERCENTAGE OF TOTAL GOVERNMENT EXPENDITURE

Definition: Total public expenditure on education (current and capital) expressed as a percentage of total government expenditure in a given financial year.

Purpose: The share of total public expenditure devoted to education allows to assess the government's policy emphasis on education relative to the perceived value of other public investments. It reflects also the commitment of a government to invest in human capital development.

Calculation method: Divide total public expenditure on education incurred by all government agencies/departments in a given financial year by the total government expenditure for the same financial year and multiply by 100.

Formula:

$$\% \text{PXE}_t = \frac{\text{PXE}_t}{\text{TPX}_t} * 100$$

Where :

$\% \text{PXE}_t$ = Public expenditure on education as a percentage of total government expenditure in financial year t.

PXE_t = Total public expenditure on education in financial year t.

TPX_t = Total government expenditure in financial year t.

Data required: Total public expenditure on education; and total government expenditure.

Data sources: Annual financial reports prepared by the Ministry of Finance; National accounts reports by the Central Statistical Office and financial reports from the various government departments engaged in education activities especially the Ministry of Education.

Data disaggregation: This indicator can be disaggregated by level of administration, by geographical location (region, urban/rural), and by purpose of expenditure (emoluments, teaching material, etc.).

Interpretation: A higher percentage of government expenditure on education shows a high government policy priority for education relative to the perceived value of other public investments, including defence and security, health care, social security for unemployment and elderly, and other social or economic sectors.

Quality standards: Total public expenditure on education should include those incurred by all concerned ministries and levels of administration. Public expenditure on education as a percentage of government expenditure can never be 100% since the latter includes expenditure on many economic and social sectors, besides education. The fact that the fiscal year and educational year budget periods may be different should also be taken into consideration.

Limitations: In some instances data on total public expenditure on education refers only to the Ministry of Education, excluding other ministries that spend a part of their budget on educational activities.

PERCENTAGE DISTRIBUTION OF PUBLIC CURRENT EXPENDITURE ON EDUCATION BY LEVEL

Definition: Public current expenditure for each level of education, expressed as a percentage of total public current expenditure on education.

Purpose: This indicator shows how financial resources for education have been distributed across the different levels or stages of education. It measures the relative emphasis of government spending on a particular level of education within the overall educational expenditure.

Calculation method: Divide public current expenditure devoted to each level of education by the total public current expenditure on education, and multiply the result by 100.

Formula:

$$\% \text{PCXE}_h^t = \frac{\text{PCXE}_h^t}{\sum_{h=1}^n \text{PCXE}_h^t} * 100$$

Where :

$\% \text{PCXE}_h^t$ = Percentage public current expenditures on level of education **h** in financial year **t**.

PCXE_h^t = Total public current expenditures on level of education **h** in financial year **t**.

Data required: Total public current expenditure on education; current public expenditures by level of education.

Data source: Annual financial reports prepared by the Ministry of Finance; National accounts reports by the Central Statistical Office and financial reports from the various government departments engaged in educational activities especially the Ministry of Education.

Type of disaggregation: This indicator can be disaggregated by level of administration, by geographical location (region, urban/rural) and by various purposes of current expenditures (emoluments, teaching materials, scholarships, welfare services, etc.).

Interpretation: Relatively high percentage of current expenditures devoted to a specific level of education denotes the priority given to that level in national educational policy and resource allocation. When interpreting this indicator, one may also take into account the corresponding distribution of enrolment by level and then assess the relative current expenditure per student.

Quality standards: This indicator should be based on consistent data on current expenditure for each level of education that cover public funding for both public and private educational institutions at all level of the educational administration. The sum of the percentage distributions for all levels of education should add up to 100%.

Limitations: In some instances data on current public expenditure on education refers only to the Ministry of Education, excluding other ministries that spend a part of their budget on educational activities.

PUBLIC CURRENT EXPENDITURE PER PUPIL (STUDENT) AS % OF GNP PER CAPITA

Definition: Public current expenditure per pupil (or student) at each level of education, expressed as a percentage of GNP per capita in a given financial year.

Purpose: This indicator measures the share of per capita income that has been spent on each pupil or student. It helps in assessing a country's level of investment in human capital development. When calculated by level of education, it also indicates the relative costs and emphasis placed by the country on a particular level of education.

Calculation method: Divide per pupil public current expenditure on each level of education in a given year by the GNP per capita for the same year and multiply by 100.

Formula:

$$\% \text{PCXE}_{h,\text{GNPc}}^t = \frac{\text{PCXE}_h^t}{E_h^t} / \frac{\text{GNP}^t}{P^t} * 100$$

Where,

$\% \text{PCXE}_{h,\text{GNPc}}^t$ = Public current expenditure per pupil of education level **h** as percentage of GNP per capita in financial year **t**

PCXE_h^t = Public current expenditure on education level **h** in financial year **t**

GNP^t = Gross National Product in financial year **t**

E_h^t = Total enrolment in education level **h** in school-year **t**

P^t = Total national population in year **t**.

Data required: Public current expenditure by level of education; the number pupils enrolled in each level of education; GNP; population.

Data sources: Annual financial reports prepared by the Ministry of Finance; National accounts reports by the Central Statistical Office; Financial reports from various government departments engaged in educational activities especially the Ministry of Education; school register, school survey or census for data on enrolment; population census.

Data disaggregation: This indicator can be disaggregated by level of education.

Interpretation: A high percentage figure for this indicator denotes a high share of per capita income being spent on each pupil/student in a specified level of education. It represents a measure of the financial cost per pupil/student in relation to average per capita income.

Quality standards: Public expenditure per pupil as percentage of GNP per capita can exceed 100%. This indicator should be based on consistent data on public expenditure that covers all subsidies to both public and private educational institutions. The use of this indicator must take into account the degree of coverage represented by the educational expenditure figure and the ability of the GNP estimate to represent the level of national economic capacity accurately.

Limitations: This indicator may be distorted by inaccurate estimation of GNP, current population or enrolment by level of education. The fact that fiscal year and educational year budget periods may be different should also be taken into consideration.

PUPIL-TEACHER RATIO

Definition: Average number of pupils (students) per teacher at a specific level of education in a given school-year. Teachers are defined as persons whose professional activity involves the transmitting of knowledge, attitudes and skills that are stipulated in a formal curriculum programme to students enrolled in a formal educational institution.

Purpose: This indicator is used to measure the level of human resources input in terms of number of teachers in relation to the size of the pupil population. It should normally be used to compare with established national norms on the number of pupils per teacher for each level or type of education.

Calculation method: Divide the total number of pupils enrolled at the specified level of education by the number of teachers at the same level.

Formula:

$$PTR_h^t = \frac{E_h^t}{T_h^t}$$

where:

PTR_h^t = Pupil-teacher ratio at level of education **h** in school-year **t**

E_h^t = Total number of pupils or (students) at level of education **h** in school-year **t**

T_h^t = Total number of teachers at level of education **h** in school-year **t**.

Data required: Number of pupils enrolled and teaching staff for the specific level of education.

Data source: School registers, teacher records, school census or surveys for data on enrolment and teaching staff.

Type of disaggregation: Data is to be disaggregated by level of education, by type of institutions (private/public) and by geographical location (region,urban/rural).

Interpretation: A high teacher pupil-ratio suggests that each teacher has to be responsible for a large number of pupils. In other words, the higher the pupil/teacher ratio, the lower is the relative access of pupils to teachers. It is generally assumed that a low pupil-teacher ratio signifies smaller classes, which enables the teacher to pay more attention to individual students, which may in the long run result in a better performance of the pupils.

Quality standards: In computing and interpreting this indicator, one should take into account the existence of part-time teaching, school-shifts, multi-grade classes and other practices that may affect the precision and meaningfulness of pupil-teacher ratios. If feasible, the number of part-time teachers is to be converted to 'full-time equivalent' teachers; a double-shift teacher is to be counted twice, etc. Care should be exercised to include all staff involved in teaching.

Limitations: This indicator does not take into account differences in teachers' qualifications, pedagogical training, experiences and status, teaching methods, teaching materials and variations in classroom conditions, factors which could affect the quality of teaching/learning.

PERCENTAGE OF FEMALE TEACHERS

Definition: The number of female teachers at a given level of education expressed as a percentage of total number of teachers (male and female) at the same level in a given school-year. Teachers are defined as persons whose professional activity involves the transmitting of knowledge, attitudes and skills that are stipulated in a formal curriculum programme to students enrolled in a formal educational institution.

Purpose: This indicator shows the gender composition of the teaching force. It helps also in assessing the need for opportunities and/or incentives to encourage women to participate in teaching activities at a given level of education.

Calculation method: Divide the total number of female teachers at a given level of education by the total number of teachers (male and female) at the same level in a given school-year, and multiply by 100.

Formula:

$$\% FT_h^t = \frac{FT_h^t}{T_h^t} * 100$$

Where:

$\% FT_h^t$ = Percentage female teachers in educational level **h** in year **t**

FT_h^t = Number of female teachers in educational level **h** in year **t**

T_h^t = Total number of teachers (male and female) in educational level **h** in year **t**.

Data required: Number of teachers by gender.

Data source: School census or surveys and teachers' records.

Type of disaggregation: This indicator can be calculated by level of education, by geographical location (region, rural/urban), by type of institutions (public and private), by teacher's age-groups and by teacher's qualifications.

Interpretation: Percentage of female teachers approaching 50% indicates gender parity in the composition of the teaching force. A value of greater than 50% reveals more opportunities and/or preference for women to participate in teaching activities at a specific level, grade or programme of education.

Quality standards: This indicator should be based on reliable data on teaching staff by gender (full and/or part-time teachers) at each level of education. When calculating this indicator, care should be exercised to ensure that the number of female teachers and the total number of teachers correspond to the same type of institution, full or part-time. Such calculation should include all staff involved in teaching.

Limitations: This indicator measures the level of gender representation in the teaching profession rather than the effectiveness and quality of teaching.

PERCENTAGE OF STUDENTS IN TERTIARY EDUCATION BY ISCED LEVEL

Definition: Enrolment in tertiary education at each **ISCED** level as a percentage of total enrolment in tertiary education.

Purpose: This indicator shows the distribution of tertiary students by ISCED levels. It also helps to understand the way in which degrees and qualification structures for tertiary education are organised within countries.

Calculation method: Divide the number of students in each tertiary ISCED level by the total enrolment in tertiary education in a given academic year, and multiply the result by 100.

Formula:

$$\% E_h^t = \frac{E_h^t}{\sum_{h=5}^7 E_h^t} * 100$$

Where:

$\% E_h^t$ = Percentage of tertiary students in ISCED level **h** in academic year **t**

E_h^t = Enrolment in tertiary ISCED level **h** in academic year **t**.

Note: Instead of the levels 5, 6 and 7 in ISCED 1976, tertiary education is composed of two levels according to the newly revised ISCED 1997: level 5 (corresponding to the first stage of tertiary education not leading directly to an advanced research qualification) and level 6 (corresponding to the second stage of tertiary education leading to an advanced research qualification).

Data required: Enrolment in tertiary education by ISCED level.

Data source: Censuses, surveys or records of tertiary educational institutions and programmes.

Type of disaggregation: This indicator is to be disaggregated by gender and mode of enrolment (part/full-time students, distance learning).

Interpretation: The relative concentration of students in particular programmes (long/short programmes) or levels is likely to be driven by job opportunities related to those levels. It also reflects capacities and policies for the development of a particular ISCED level.

Quality standards: This indicator requires complete and reliable data on enrolment in tertiary education and consistency in definitions of different levels and programmes according to ISCED.

Limitations: Caution is required when using this indicator for inter-country comparison and over time, since tertiary education programmes can vary widely in duration, intensity and degree of theoretical and applied content, and their correspondence to ISCED may be subject to changes.

PERCENTAGE OF FEMALE STUDENTS IN EACH ISCED LEVEL OF TERTIARY EDUCATION

Definition: Female enrolment in each ISCED tertiary education level as a percentage of total enrolment (male plus female) in the same ISCED level.

Purpose: This indicator helps to assess gender disparity with regard to participation in different levels of tertiary education.

Calculation method: Divide the number of female tertiary students enrolled in a specified ISCED level by the total number of students (male plus female) in that level in a given academic-year, and multiply the result by 100.

Formula:

$$\% FE_h^t = \frac{FE_h^t}{E_h^t} * 100$$

Where:

$\% FE_h^t$ = Percentage of female students in ISCED tertiary education level **h** in academic year **t**

FE_h^t = Female students in ISCED tertiary education level **h** in academic year **t**

E_h^t = Total enrolment (male plus female) in ISCED tertiary education level **h** in academic year **t**.

Data required: Enrolment in tertiary education by ISCED level and by gender.

Data source: Census, surveys or records of tertiary educational institutions and programmes.

Type of disaggregation: This indicator is to be disaggregated by field of education and mode of enrolment (part/full-time students, distance learning).

Interpretation: Percentage of female students that approaches 50% indicates a good level of gender parity. By comparing the percentages of female students for different levels and fields of education, one can identify the relative degree of gender disparity among the different levels or programmes of tertiary education.

Quality standards: This indicator requires complete and reliable data on enrolment by gender in tertiary education and consistency in definitions of different levels and programmes according to ISCED.

Limitations: Caution is required when using this indicator for inter-country comparison and over time, since tertiary education programmes vary widely in duration, intensity and degree of theoretical and applied content and their correspondence to ISCED may be subject to changes.

STUDENTS IN TERTIARY EDUCATION BY ISCED FIELDS OF EDUCATION.

Definition: Enrolment in each **ISCED** field of education in tertiary education, expressed as a percentage of the total enrolment in tertiary education.

Purpose: By showing the distribution of tertiary students by field of education, this indicator can be used to gauge the level of development of tertiary education in terms of the range of fields offered, the capacity in each field as well as student preferences, thus reflecting both the potential demand and supply of qualified human resources in different specializations.

Calculation method: Divide the number of students enrolled in each field of education by the total enrolment in tertiary education in a specific academic-year , and multiply the result by 100.

Formula:

$$\% E_f^t = \frac{E_f^t}{\sum_{f=1}^n E_f^t} * 100$$

Where:

$\% E_f^t$ = Percentage of students enrolled in field of education **f** in academic-year **t**

E_f^t = Number of students enrolled in field of education **f** in academic-year **t**.

n = Number of fields of education

Data required: Enrolment in tertiary education by field of education.

Data source: Censuses, surveys or records of tertiary educational institutions and programmes.

Type of disaggregation: This indicator is to be disaggregated by gender, by ISCED level in tertiary education and by mode of enrolment (part/full-time).

Interpretation: Relative concentration of students in particular fields of education depicts on the one hand high preference and capacity, and on the other hand may reflect job opportunities as well as relative earnings across different occupations and industries.

Quality standards: This indicator requires complete and reliable data on enrolment by fields of education in tertiary education and clear distinction between different fields of education.

Limitations: Inter-country comparisons rely heavily on how far countries have used consistent field definitions. Detailed or aggregated information may not be fully comparable at the international level due to exclusions, double counting of students, partial data, etc. Also, differences in duration, intensity and degree of theoretical and applied content, together with inappropriate correspondence with ISCED, can bias comparisons between countries.

PERCENTAGE DISTRIBUTION OF GRADUATES BY ISCED FIELDS OF EDUCATION IN TERTIARY EDUCATION

Definition: The number of graduates from each **ISCED** field of education in tertiary education, expressed as a percentage of the total number of graduates in tertiary education.

Purpose: This indicator shows the distribution of tertiary graduates over different fields of education. It indicates also the development of tertiary education in terms of the range of fields offered as well as the supply of qualified human resources in different specializations.

Calculation method: Divide the number of graduates in each field of education by the total number of graduates in tertiary education in a given academic-year, and multiply the result by 100.

Formula:

$$\% G_f^t = \frac{G_f^t}{\sum_{f=1}^n G_f^t} * 100$$

Where:

$\% G_f^t$ = Percentage of students graduating from the field of education **f** in academic-year **t**

G_f^t = Number of students graduating from the field of education **f** in academic-year **t**.

n = Number of fields of education

Data required: Graduates in tertiary education by field of education.

Data source: Census, surveys or records of tertiary educational institutions and programmes.

Type of disaggregation: This indicator is to be disaggregated by gender and by ISCED levels of tertiary education.

Interpretation: Relative concentration of graduates in particular fields of education depicts on the one hand high preference and capacity, on the other hand may reflect job opportunities as well as relative earnings across different occupations and industries.

Quality standards: This indicator requires complete and reliable data on the number of graduates by field of education in tertiary level and clear distinction between different fields of education.

Limitations: Inter-country comparisons rely heavily on how far countries have used consistent field definitions. Detailed or aggregated information may not be fully comparable at the international level due to exclusions, double counting of students, partial data, etc. Also, differences in duration, intensity and degree of theoretical and applied content can bias comparisons between countries.

PERCENTAGE OF PRIVATE ENROLMENT

Definition: Enrolment in private educational institutions at a given level of education expressed as a percentage of total enrolment at the same level. By 'Private' is meant here all educational institutions not operated by a public authority, whether or not they receive financial support from such authorities.

Purpose: This indicator gives the relative weight of private education in terms of enrolment, hence the scale and capacity of private education within a country.

Calculation method: Divide the number of pupils (or students) enrolled in private educational institutions in a given level of education by the total enrolment (public and private) at the same level of education, and multiply the result by 100.

Formula:

$$\% E p_h^t = \frac{E p_h^t}{E_h^t} * 100$$

where

$\% E p_h^t$ = Percentage of pupils enrolled in private institutions at level of education **h** in school-year **t**.

$E p_h^t$ = Number of pupils enrolled in private institutions at level of education **h** in school-year **t**.

E_h^t = Total number of pupils enrolled in all types of institutions at level of education **h** in school-year **t**.

Data required: Enrolment by level of education and by type of institution (public/private).

Data source: Schools census or surveys.

Type of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural) and by level of education.

Interpretation: A high percentage of enrolment in private educational institutions indicates a strong involvement of the non-governmental sector (including religious bodies, non-governmental organisations, associations, communities, private enterprises or persons) in providing organized educational programmes.

Quality standards: This indicator should be based on complete and reliable data on enrolment in each of the different types of educational institutions, applying consistent definitions and criteria to distinguish between public and private educational institutions.

Limitations: In countries where private institutions are substantially subsidized or aided by the government, the distinction between private and public educational institutions may be less clear-cut especially when certain pupils (or students) are directly financed through government scholarships. The fact that some religious or private schools are not registered with the government nor follow the common national curriculum may also result in them not being included in official statistics, hence preventing a realistic assessment of the share of enrolment in private education.

PERCENTAGE TEACHING STAFF IN PRIVATE EDUCATIONAL INSTITUTION

Definition: Number of teachers in private educational institutions at a given level of education expressed as a percentage of the total teaching staff in all types of institutions at the same level of education. By 'Private' is meant here all educational institutions not operated by a public authority, whether or not they receive financial support from such authorities.

Purpose: This indicator gives the relative weight of private education in terms of teaching staff, hence the scale and human resources in private education within a country. When analysed together with the corresponding pupil-teacher ratio, this indicator shows the relative size of the teaching force in relation to enrolment in private education.

Calculation method: Divide the number of teachers in private educational institutions in a given level of education by the total number of teachers (in both public and private educational institutions) at the same level, and multiply the result by 100.

Formula:

$$\%Tp_h^t = \frac{Tp_h^t}{T_h^t} * 100$$

where

$\%Tp_h^t$ = Percentage of teaching staff in private institutions at the level of education **h** in school-year **t**.

Tp_h^t = Teaching staff in private institutions at the level of education **h** in school-year **t**.

T_h^t = Total number of teachers (in public and private educational institutions) at level of education **h** in school-year **t**.

Data required: Teaching staff by level of education and by type of institution (public/private).

Data source: Schools census or surveys; teachers' records.

Type of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural) and by level of education.

Interpretation: A high percentage of teaching staff in private institutions indicates high involvement of the non-governmental sector (including religious bodies, associations, communities, private enterprises or persons) in providing organized educational programmes. By comparing the corresponding pupil-teacher ratios, one can assess the relative quantitative strength of the teaching force in public and private institutions in relation to the respective size of enrolment.

Quality standards: This indicator requires complete and reliable data on teaching staff for all types of educational institutions, applying consistent definitions and criteria to distinguish between public and private institutions.

Limitations: In countries where private institutions are substantially subsidized or aided by the government, the distinction between private and public educational institutions may be less clear-cut especially when certain teachers are paid by government. The fact that some religious or private schools are not registered with the government nor follow the common national curriculum may also result in them not being included in official statistics, hence preventing a realistic assessment of the share of teachers in private education.

EDUCATIONAL ATTAINMENT OF THE POPULATION AGED 25 YEARS AND ABOVE

Definition: Percentage distribution of population aged 25 years and above according to the highest level of education attained or completed with reference to **ISCED**.

Purpose: This indicator shows the educational composition of the population aged 25 years and above, hence the stock and quality of human capital within a country, so as to gauge needs and establish policies for upgrading it. This indicator also reflects the structure and performance of the education system and its accumulated impact on human capital formation.

Calculation method: Divide the number of persons aged 25 years and above with respect to the highest level of education attained by the total population of the same age-group, and multiply by 100.

Formula:

$$\% P_{25+,h}^t = \frac{P_{25+,h}^t}{P_{25+}^t} * 100$$

where

$\% P_{25+,h}^t$ = Percentage of the population aged 25 years and above that attained educational level **h**, in year **t**.

$P_{25+,h}^t$ = Population aged 25 years and above that attained educational level **h**, in year **t**

P_{25+}^t = Total population aged 25 years and above in year **t**.

Data required: Population aged 25 years and above by highest level of education attained.

Data source: Mainly national population census; household and/or labour force surveys.

Type of disaggregation: This indicator is to be disaggregated by gender, by geographical location (region, urban/rural), by age-group, and by professional sector.

Interpretation: A relative high concentration of the adult population in a given level of education reflects the capacity of the educational system in the corresponding level of education. Educational attainment is closely related to the skills and competencies of a country's population, and could be seen as a proxy of both the quantitative and qualitative aspects of the stock of human capital.

Quality standards: This indicator should be based on complete and reliable census or survey data, applying clear classification of levels of education in accordance with ISCED.

Limitations: Caution is required when using this indicator for inter-country comparison, since the countries do not always classify degrees and qualifications at the same ISCED levels, even if they are received at roughly the same age or after a similar number of years of schooling. Also, certain educational programmes and study courses cannot be easily classified within actual ISCED system. This indicator only measures the educational attainment in terms of level of education attained, i.e. years of schooling, and do not necessarily reveal the quality of the education (learning achievement and other impacts).

NUMBER OF STUDENTS IN TERTIARY EDUCATION PER 100,000 INHABITANTS

Definition: Number of students enrolled in tertiary education in a given academic-year per 100,000 inhabitants.

Purpose: This indicator shows the general level of participation in tertiary education by indicating the proportion (or density) of students within a country's population.

Calculation method: Divide the total number of students enrolled in tertiary education in a given academic-year by the country's population and multiply the result by 100,000.

Formula:

$$S_{100,000}^t = \frac{\sum_{h=5}^7 E_h^t}{P^t} * 100,000$$

where

$S_{100,000}^t$ = Number of students in tertiary education per 100,000 inhabitants in year **t**.

E_h^t = Number of student enrolled in ISCED level **h** in tertiary education in year **t**.

P^t = Country's population in year **t**.

Note: Instead of the levels 5, 6 and 7 in ISCED 1976, tertiary education is composed of two levels according to the newly revised ISCED 1997: level 5 (corresponding to the first stage of tertiary education not leading directly to an advanced research qualification) and level 6 (corresponding to the second stage of tertiary education leading to an advanced research qualification).

Data required: Enrolment in tertiary education and total population.

Data source: Censuses, surveys or records of tertiary educational institutions and programmes, and population census.

Type of disaggregation: This indicator is to be disaggregated by gender and by geographical location (region, urban/rural).

Interpretation: A high number of students per 100,000 inhabitants indicates a generally high level of participation in tertiary education in relation to a country's population.

Quality standards: This indicator should be based on complete and reliable data on students in all levels and types of tertiary education. In principle, it should refer to all students within a country's territory, irrespective of nationality or origin, and it should not take into account nationals studying in another country nor those enrolled in branches of national tertiary education in another country.

Limitations: As this indicator takes into account the entire population in a country instead of the age-group corresponding to tertiary education, its comparability may be affected by the relative weight of this latter within the entire population. When data are available for students and/or population by age, more precise assessment of participation in tertiary education can be made by using the age specific and/or gross enrolment ratios. (**ASER**, **GER**).

ENROLMENT IN SECONDARY EDUCATION BY TYPE OF EDUCATION

Definition: Percentage distribution of students enrolled in secondary education, according to the type of education, i.e. general and vocational/technical education, including teacher training.

Purpose: This indicator gives an idea of the type of secondary education offered, the capacity in each type as well as the potential supply of skilled workers in different specializations.

Calculation method: Divide the number of students enrolled in each type of secondary education by the total enrolment in secondary education in a given year, and multiply the result by 100

Formula:

$$\% E_s^t = \frac{E_s^t}{\sum_{s=1}^n E_s^t} * 100$$

Where:

$\% E_s^t$ = Percentage of students enrolled in type s secondary education in school-year t

E_s^t = Number of students enrolled in type s secondary education in school-year t

n = Number of types of secondary education

Data required: Enrolment in secondary education by type of education.

Data source: Census, surveys or records of secondary educational institutions and programmes.

Type of disaggregation: This indicator is to be disaggregated by gender, by type of institution (public/private), and by geographical location (region, urban/rural).

Interpretation: The relative concentration of students in a particular type of education depicts on the one hand high preference and capacity, on the other hand may reflect job opportunities as well as relative earnings across different occupations and industries.

Quality standards: This indicator requires complete and reliable data on enrolment by type of secondary education and clear distinction between different types of education.

Limitations: Inter-country comparability of this indicator can be affected by different ways in which national secondary education systems are organized according to different types (e.g. general, technical-vocational, etc.).

PUBLIC CURRENT EXPENDITURE ON EDUCATION AS PERCENTAGE OF TOTAL PUBLIC EXPENDITURE ON EDUCATION.

Definition: Public current expenditure on education expressed as a percentage of total public expenditure on education (current and capital) in a given financial year.

Purpose: This indicator shows the share of current expenditure within total public expenditure, thereby indicating the pattern of government spending on education in terms of the relative weight between current and capital expenditure.

Calculation method: Divide public current expenditure on education in a given financial year by the total public expenditure on education for the same financial year and multiply by 100.

Formula:

$$\% \text{PCXE}_t = \frac{\text{PCXE}_t}{\text{TPXE}_t} * 100$$

Where :

$\% \text{PCXE}_t$ = Percentage public current expenditure on education in financial year **t**.

PCXE_t = Total public current expenditure on education in financial year **t**.

TPXE_t = Total public expenditure in financial year **t**.

Data required: Total public current expenditure on education and total public expenditure on education (current plus capital).

Data sources: Annual financial reports prepared by the Ministry of Finance; National accounts reports by the Central Statistical Office and financial reports from the various government departments engaged in education activities especially the Ministry of Education.

Data disaggregation: This indicator is usually calculated at the national level only. It can be disaggregated by level of administration (central, regional, local government).

Interpretation: A high percentage of public current expenditure on education reflects the need to devote a large share of public funding to maintain the education system operations, taking into account current and projected changes in enrolment, in the salary levels of educational personnel and in other operational costs. The difference between this percentage and 100 reflects the proportion of public expenditure on education devoted to capital expenditure.

Quality standards: This indicator should be based on consistent and comprehensive data on all public current expenditure on education, including those incurred by regional and local government, and other ministries than the Ministry of Education.

Limitations: In many instances data on total public current expenditure on education cover only the Ministry of Education, excluding other ministries that spend a sizeable part of their budget on educational activities.

TEACHERS' EMOLUMENTS AS PERCENTAGE OF PUBLIC CURRENT EXPENDITURE ON EDUCATION.

Definition: Public expenditure devoted to teachers' emoluments expressed as a percentage of total public current expenditure on education.

Purpose: This indicator measures the share of teachers' emoluments within public current expenditure on education, in relation to spending on administration, teaching materials, scholarships, etc.

Calculation Method: Divide public current expenditure devoted to teachers' emoluments in a given financial year by the total public current expenditure on education for the same financial year and multiply by 100.

$$\% \text{TX}_t = \frac{\text{TX}_t}{\text{PCXE}_t} * 100$$

Where :

$\% \text{TX}_t$ = Percentage of public current expenditure on education devoted to teachers' emoluments in financial year **t**.

TX_t = Total public current expenditure on teachers' emoluments in financial year **t**.

PCXE_t = Total public current expenditure on education in financial year **t**.

Data required: Total public current expenditure on education and public current expenditure on teachers' emoluments.

Data sources: Annual financial reports prepared by the Ministry of Finance; National Accounts reports by the Central Statistical Office and financial reports from the various government departments engaged in education activities especially the Ministry of Education.

Data disaggregation: This indicator can be disaggregated by level of education and by level of administration (central, regional, local government).

Interpretation: A higher percentage of public current expenditure devoted to teachers' emoluments denotes the preponderance of spending on teachers' compensation to the detriment spending on administration, teaching materials, scholarships, etc. The way in which educational spending is allocated between these different purposes i.e. teachers' salaries and the condition of education facilities (e.g. expenditure on teaching materials, etc) can affect the quality of education.

Quality standard: This indicator should be based on reliable data on teachers' emoluments, including emoluments of all staff (full and/or part-time) involved in teaching, covering both salaries and fringe benefits.

Limitations: In many instances data on total public current expenditure on education cover only the Ministry of Education, excluding other ministries that spend a part of their budget on educational activities. It may sometimes be difficult to account for the share of emoluments of educational personnel who share their hours between teaching and other tasks.