Education Indicators
Technical guidelines

November 2009

SUMMARY

ADULT LITERACY OR ILLITERACY RATE

Definition: 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. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations. 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: To show 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.

Calculation method: Divide the number of literates aged 15 years and over 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:

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

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: 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) suggests the existence of an effective primary education system and/or literacy programmes that have enabled a large proportion of the population to acquired the ability of using the written word (and making simple arithmetic calculations) 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: The rate cannot exceed 100%. 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: To identify the size and, if possible, 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.

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

Type of disaggregation: By gender, 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 greater the need to expand 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: 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.

GROSS INTAKE RATIO (GIR) IN THE FIRST GRADE OF PRIMARY

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: To indicate 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.

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:

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

Where:

GIR^t Gross Intake Ratio 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.

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: By gender and by geographical location (region, rural/urban).

Interpretation: A high GIR indicates a high degree of access to primary education. As this calculation includes all new entrants to first grade (regardless of age), the ratio can exceed 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 GIR.

Limitations: A high GIR 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 (NIR) IN THE FIRST GRADE OF PRIMARY

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 precisely measure access to primary education by 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 for the first time by the population of the same age, and multiply the result by 100.

Formula:

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

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 for the first time, 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: By gender and by geographical location (region, rural/urban).

Interpretation: A high NIR indicates a high degree of access to primary education for the official primary school-entrance age children. NIR of 100% is a necessary condition for the policy goal of universal primary education.

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 (SLE)

Definition: 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: To show the overall level of development of an educational system in terms of the average number of years of schooling that the education system offers to the eligible population, including those who never enter school.

Calculation method: For a child of a certain age **a**, the school life expectancy is calculated as the sum of the **age specific enrolment rates** for the levels of education specified. The part of the enrolment that is not distributed by age is divided by the school-age population for the level of education they are enrolled in, and multiplied by the duration of that level of education. The result is then added to the sum of the age-specific enrolment rates.

Formula:

$$SLE_a^t = \sum_{i=a}^{n} \frac{E_i^t}{P_i^t} + \sum_{l=level\_education} \frac{E_{unknown}^t}{P_{age\_of\_level\_l}^t / D_l}$$

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.** Age of level l denotes the total school age population of that level

D_l Theoretical duration of level l

Data required: Enrolment by age and of age unknown at all levels of education; population 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: By levels of education and by gender.

Interpretation: A relatively high SLE 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 repetition. Since school life expectancy is an average based on participation in different levels of education, the expected number of years of schooling may be pulled down by the magnitude of children who never go to school. Those children who are in school may benefit from many more years of education than the average.

Quality standards: 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 making cross-country comparisons; 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 RATE (TR)

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: To convey 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 for year t and new entrants to (or enrolment minus repeaters) the first grade of the higher cycle or level of education for year t+1.

Data source: School register, school survey or census.

Data disaggregation: 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 (GER)

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: 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 can also be a complementary indicator to net enrolment rate (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: By gender, 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 approaching or exceeding 100% 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% is therefore a necessary but not sufficient condition for enrolling all eligible children in school. When the GER exceeds 90% 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 organized educational programmes.

Limitations: GER can exceed 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 RATE (NER)

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 coverage 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 (or students) 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 Rate 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: By gender, geographical location (region, urban/rural) and by level of education.

Interpretation: A high NER denotes a high degree of coverage for the official school-age population. The theoretical maximum value is 100%. Increasing trends can be considered as reflecting improving coverage at the specified level of education. When the NER is compared with the GER, the difference between the two 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. To measure universal primary education, for example, adjusted primary NER is calculated on the basis of the percentage of children in the official primary school age range who are enrolled in either primary or secondary education. A more precise complementary indicator is the age-specific enrolment ratio (**ASER**) which shows the participation in education of the population of each particular age, regardless of the level of education.

Quality standards: NER at each level of education should be based on enrolment of the relevant age group 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, difficulties may arise when calculating an NER that approaches 100% if:
1. the reference date for entry to primary education does not coincide with the birth dates of all of the cohort eligible to enrol at this level of education;
2. a significant portion of the population starts primary school earlier than the prescribed age and consequently finishes earlier as well;

3. there is an increase in the entrance age to primary education but the duration remains unchanged.

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

AGE SPECIFIC ENROLMENT RATE (ASER)

Definition: Enrolment of a specific single age enrolled, irrespective of the level of education, as a percentage of the population of the same age.

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

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 Rate 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: 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 organized 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 except when it is calculated by level of education.

REPETITION RATE BY GRADE (RR)

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: To measure the rate at which pupils from a cohort repeat 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:

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

Where:

RR_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: By grade, gender, geographical location (regions, urban/rural) and by type of institution (public/private).

Interpretation: Repetition Rate ideally should approach zero percent. High repetition rate reveals problems in the internal efficiency of the educational system and possibly reflect a poor level of instruction. 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 dropout rates), 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: In some cases, low repetition rates merely reflect policies or practices of automatic promotion. 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 RATE BY GRADE (SR)

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: To measure the retention capacity 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 dropout 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. The survival rate is calculated on the basis of the reconstructed cohort method, which uses data on enrolment and repeaters for two consecutive years.

Formula:

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

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: By gender, geographical location (region, urban/rural) and by type of institution (private/public). Survival rates can also be disaggregated with or without grade repetition.

Interpretation: Rates approaching 100% indicate a high level of retention and low incidence of dropout. The distinction between survival rate with and without repetition is necessary to compare the extent of wastage due to dropout and repetition. Survival rate to the last grade of primary education is of particular interest for monitoring universal primary education, a central objective for Education for All and the Millennium Development Goals.

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 (i.e. the observed flow rates will remain unchanged throughout the cohort life), care should be taken in using of the results in comparisons. Care should also be taken in calculating the indicator at sub-national level because of possible pupils' transfers between localities.

COEFFICIENT OF EFFICIENCY

Definition: The ideal (optimal) number of pupil-years required (i.e. in the absence of repetition and dropout) 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 dropout 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. The coefficient of efficiency is calculated on the basis of the reconstructed cohort method, which uses data on enrolment and repeaters for two consecutive years.

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**

$G_{g,n}$ — Number of pupils graduating from cohort **g** in final grade **n** after **n** years of study (without repetition)

$G_{g,j}$ — Number of pupils graduating from cohort **g** in final grade **n** after **j** years of study

$D_{g,j}$ — Number of pupils (of the cohort **g**) dropping out after **j** years of study

k   Number of repetitions allowed
n   Normal duration of study for a cycle or level of education
g   Pupil-cohort
j   Number of years of study.

Data required: Number of graduates and dropouts by length of study. These data can also be derived by 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: By gender, geographical location (region, urban/rural) and by school type (private/public).

Interpretation: Results approaching 100% indicate a high overall level of internal efficiency in producing graduates and no wastage due to repetition and dropout. Coefficients below 100% reflect the impact of repetition and dropout on the efficiency of the educational process in producing graduates. As the reciprocal, the optimum input-output ratio is one, 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 cross-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 dropouts (i.e. from lower grades) can result in higher internal efficiency than late dropout (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 dropout 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 dropouts) in the specified level of education by the sum of the successive batch of graduates belonging to the same cohort. This indicator is calculated on the basis of the reconstructed cohort method, which uses data on enrolment and repeaters for two consecutive years.

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

$D_{g,j}$ Dropouts from cohort **g** after **j** years of study

k   Number of repetitions allowed
n   Normal duration of study for a cycle or level of education
g   Pupil-cohort
j   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: By gender, 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 dropout. 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 terms 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 cross-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 dropouts (i.e. from lower grades) can result in higher internal efficiency than late dropout (i.e. from higher grades); this means that efficiency from the economic point of view can be in contradiction with educational objectives aiming to retain 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: To measure 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. It can be calculated for the whole level of education by dividing the sum of repeaters in all grades of the given level by the total enrolment of that level of education and multiply the result by100.

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: By gender, geographical location (region, rural/urban areas) and level of education.

Interpretation: High values reflect serious problems of grade repetition or the internal efficiency of the education system.

Quality standards: The definition of repeaters 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.

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 **<u>internal efficiency</u>** 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 % OF GROSS NATIONAL INCOME

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

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. The indicator can be also calculated based on Gross Domestic product (GDP)

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

Formula:

$$\% XGNI_t = \frac{PXE_t}{GNI_t} * 100$$

Where :

$\% XGNI_t$ Percentage public expenditure on education in financial year **t**

PXE_t Total Public expenditure on Education in financial year **t**

GNI_t Gross National Income in financial year **t**

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

Data sources: Annual financial reports by central or federal governments, state or provincial or regional administrations. Data on GNI 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 GNI 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. Public expenditure on education as a percentage of GNI cannot exceed or even approach 100%.

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 % 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: To assess a 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:

$$\%PXE_t = \frac{PXE_t}{TPX_t} * 100$$

Where :

$\% PXE_t$ 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: By level of administration, 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. This indicator 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: To show 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:

$$\%PCXE_h^t = \frac{PCXE_h^t}{\sum_{h=1}^{n} PCXE_h^t} *100$$

Where :

$\%PCXE_h^t$ 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: By level of administration, 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 levels 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 GROSS NATIONAL INCOME (GNI) PER CAPITA

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

Purpose: To measure the share of per capita income 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. The indicator can be also calculated based on gross domestic product (GDP).

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

Formula:

$$\%PCXE_{h,GNIc}^{t} = \frac{PCXE_h^t}{E_h^t} / \frac{GNI^t}{P^t} * 100$$

Where,

$\%PCXE_{h,GNIc}^{t}$ Public current expenditure per pupil of education level **h** as percentage of GNI per capita in financial year **t**

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

GNI^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; GNI; 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: 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. A high level of spending per pupil should be interpreted with caution because this could simply reflect low enrolment. This indicator should therefore be used in conjunction with enrolment ratios. Low expenditure per pupil and low enrolment in primary education when compared to high expenditure and/or low enrolment in tertiary education suggests a need to reconsider resource allocations within the education sector, especially if universal primary education is a priority.

Quality standards: This indicator can exceed 100% in countries where GNI per capita is low and the current cost per pupil is high. 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 GNI estimate to accurately represent the level of national economic capacity.

Limitations: This indicator may be distorted by inaccurate estimation of GNI, 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 (PTR)

Definition: Average number of pupils (students) per teacher at a specific level of education in a given school year.

Purpose: To measure the level of human resources input in terms of the number of teachers in relation to the size of the pupil population. The results can be compared 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: By level of education, 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 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. 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.

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

PERCENTAGE OF FEMALE TEACHERS

Definition: The number of female teachers at a given level of education expressed as a percentage of the total number of teachers (male and female) at the same level in a given school year.

Purpose: To show 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: By level of education, geographical location (region, rural/urban), by type of institutions (public and private), by teacher age groups and teacher 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. 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.

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

PERCENTAGE DISTRIBUTION 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: To show 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 organized 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:

$$\%E_h^t = \frac{E_h^t}{\sum\limits_{h \in (5A,5B,6)} E_h^t} * 100$$

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**

Data required: Enrolment in tertiary education by ISCED level.

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

Type of disaggregation: 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. The percentage in all levels of tertiary education must equal 100.

Limitations: Caution is required when using this indicator for cross-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 change.

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: 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: By field of education and mode of enrolment (part/full-time students, distance learning).

Interpretation: A figure approaching 50% indicates a good level of gender parity. It is also useful to compare the percentages of female students for different levels and fields of education. When disaggregated by field of education, this indicator can identify those fields more or less attractive for a specified gender.

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 cross-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 change.

PERCENTAGE DISTRIBUTION OF STUDENTS IN TERTIARY EDUCATION BY ISCED FIELDS OF EDUCATION.

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

Purpose: 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 total enrolment in tertiary education in a specific academic-year and multiply the result by 100.

Formula:

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

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: By gender, 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 at the tertiary level and clear distinction between different educational fields. The sum of percentages for all fields of tertiary education should equal 100.

Limitations: Cross-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 AT THE TERTIARY LEVEL

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: To show the distribution of tertiary graduates over different fields of education. It also reflects 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:

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

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: By gender and ISCED levels of tertiary education.

Interpretation: Relative concentration of graduates in particular fields of education depicts high preference and capacity in these programmes as well as related job opportunities.

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. The percentage in all fields of tertiary education must sum up to 100.

Limitations: Cross-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.

Purpose: To measure 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 total enrolment (public and private) at the same level of education, and multiply the result by 100.

Formula:

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

where

$\%Ep_h^t$ Percentage of pupils enrolled in private institutions at level of education **h** in school year **t**

Ep_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: By gender, geographical location (region, urban/rural) and by level of education.

Interpretation: A high percentage indicates strong involvement of the non-governmental sector (including religious bodies, other organizations, 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. 'Private' refers to all educational institutions not operated by a public authority, regardless of whether they receive financial support from such authorities.

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 OF 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.

Purpose: To measure 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: By gender, geographical location (region, urban/rural) and level of education.

Interpretation: A high percentage 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. 'Private' refers to all educational institutions not operated by a public authority, regardless of whether they receive financial support from such authorities.

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: To show 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 the result by 100.

Formula:

$$\%P^t_{25+,h} = \frac{P^t_{25+,h}}{P^t_{25+}} * 100$$

where

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

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

P^t_{25+} 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: 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 cross-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 according to ISCED. This indicator only measures 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:

$$S_{100,000}^t = \frac{\sum\limits_{h \in (5A, 5B, 6)} E_h^t}{P^t} * 100,000$$

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**

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: By gender and by region.

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**).

PERCENTAGE DISTRIBUTION OF ENROLMENT IN SECONDARY EDUCATION BY ORIENTATION OF EDUCATION PROGRAMME

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

Purpose: To reflect the orientation and capacity of secondary education programmes 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 programme (classified by orientation) by total enrolment in secondary education in a given year, and multiply the result by 100.

Formula:

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

Where:

$\%E_s^t$ Percentage of students enrolled in orientation **s** of secondary education in school year **t**

E_s^t Number of students enrolled in orientation **s** of secondary education in school year **t**

n   Number of orientations of secondary education

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

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

Type of disaggregation: By gender, type of institution (public/private), and geographical location (region, urban/rural).

Interpretation: The relative concentration of students in a particular orientation 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 orientation of secondary education and clear distinction between different orientations of education. The percentage in all orientations of education must sum up to 100.

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

PUBLIC CURRENT EXPENDITURE ON EDUCATION AS % 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: To show 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 the result by 100.

Formula:

$$\%PCXE_t = \frac{PCXE_t}{TPXE_t} * 100$$

Where :

$\%PCXE_t$	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 on education 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 reflects the need to devote a large share of public funding to maintain operations of the education system as well as current and projected changes in enrolment, salary levels of personnel and 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.

PERSONNEL COMPENSATION AS % OF PUBLIC CURRENT EXPENDITURE ON EDUCATION.

Definition: Public expenditure devoted to personnel compensation expressed as a percentage of total public current expenditure on education.

Purpose: To measure the share of personnel compensation within public current expenditure on education, in relation to spending on administration, teaching materials, scholarships, etc.

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

$$\%PX_t = \frac{PX_t}{PCXE_t} * 100$$

Where :

$\%PX_t$ Percentage of public current expenditure on education devoted to personnel's compensation in financial year **t**

PX_t Total public current expenditure on personnel compensation 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 personnel compensation.

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: By level of education and level of administration (central, regional, local government).

Interpretation: A higher percentage denotes the preponderance of spending on personnel 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. teacher salaries and the condition of education facilities (e.g. expenditure on teaching materials, etc) can affect the quality of education. 'Personnel' refers to teaching and non teaching staff.

Quality standard: This indicator should be based on reliable data on personnel compensation, including emoluments of all staff (full and/or part-time) working in educational institutions, 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.

GROSS INTAKE RATIO IN THE LAST GRADE OF PRIMARY (GIRLG)

Definition: Total number of new entrants in the last grade of primary education, regardless of age, expressed as a percentage of the population at the theoretical entrance age to the last grade of primary.

Purpose: This proxy measure of primary completion also reflects the impact of policies shaping the early grades of primary school can impact the final grade of this education level. It also indicates the capacity of the education system to provide primary completion for the theoretical entrance age population to the last grade of primary.

Calculation method: Divide the number of new entrants in last grade of primary, irrespective of age, by the population of theoretical entrance age to the last grade of primary, and multiply the result by 100.

Formula:

$$GIRLG^t = \frac{NE_l^t}{P_a^t} * 100$$

Where:

$GIRLG^t$ Gross Intake Ratio in the Last Grade of primary in school year **t**

NE_l^t Number of new entrants in the last grade **l** of primary education, in school year **t**

P_a^t Population of theoretical entrance age **a** in the last grade of primary, 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 last grade.

Data required: New entrants in the last grade of primary education (or enrolment minus repeaters in the last grade); population of the theoretical entrance age in the last grade of primary.

Data source: School register, school survey or census for data on new entrants. Population census or estimates for population of the theoretical entrance age in the last grade of primary.

Type of disaggregation: By gender and geographical location (region, rural/urban).

Interpretation: A high ratio indicates a high degree of current primary education completion.

Quality standards: Data on population used in deriving this indicator should refer strictly to the theoretical entrance age in the last grade of primary. Care should be taken not to include repeaters in the last grade, which would inflate the ratio.

Limitations: The calculation includes all new entrants to last grade (regardless of age). Therefore, the ratio can exceed 100%, due to over-aged and under-aged children who enter primary school late/early and/or repeat grades.

EXPECTED GROSS INTAKE RATIO IN THE LAST GRADE OF PRIMARY (EGIRLG)

Definition: Total number of new entrants to the first grade of primary in a given year, regardless of age, who are expected to reach the last grade of primary education, regardless of repetition, expressed as a percentage of the population at the official entrance age to primary education in the same year.

Purpose: To estimate the future gross intake in the last grade of primary education based on current new entrants to the first grade of primary education assuming current grade transition and repetition rates remain unchanged. It therefore predicts the effect on last grade intake of current education policies on entrance to primary education and future years of schooling.

Calculation method: Multiply the gross intake ratio to the first grade of primary education by the survival rate to the last grade of primary. The survival rate is calculated on the basis of the reconstructed cohort method, which uses data on enrolment and repeaters for two consecutive years.

Formula:

$$EGIRLG^{\,t} = GIR^{\,t} \; X \; SR_{g,l}^{\,t-1}$$

Where:

$EGIRLG^{\,t}$ Expected Gross Intake Ratio in the last grade of primary in school year **t**

$GIR^{\,t}$ Gross Intake Ratio in the first grade of primary in school year **t** (see Glossary for GIR definition and formula)

$SR_{g,l}^{\,t-1}$ Survival Rate of pupil-cohort g at last grade **l** for a reference year t-1 (see Glossary for SR definition and formula)

Data required: Enrolment by grade for two consecutive years (years t-1 and t); number of repeaters by grade for year t; population of the official primary school-entrance age for year t.

Data source: School register, school survey or census for enrolment and repeaters; population census or estimates.

Type of disaggregation: By gender and geographical location (region, rural/urban). Care should be taken in calculating the indicator at sub-national level because of pupils may transfer between localities.

Interpretation: A high ratio indicates a high degree of future primary education completion.

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.

Limitations: Given that this indicator is estimated using **cohort analysis** models that are based on a number of assumptions (i.e. the observed flow rates will remain unchanged throughout the cohort life), care should be taken in making comparisons.

GROSS PRIMARY GRADUATION RATIO (GPGR)

Definition: Total number of graduates from the last grade of primary education, regardless of age, expressed as a percentage of the population at the theoretical graduation age for primary.

Purpose: To indicate the general level of primary education graduation. This proxy measure of primary completion reports the current primary outputs stemming from previous years of schooling and past education policies on entrance to primary education. It also indicates the capacity of the education system to provide primary graduation for the theoretical graduation age population.

Calculation method: Divide the number of primary graduates, irrespective of age, by the population of theoretical primary graduation, and multiply the result by 100.

Formula:

$$GPGR^t = \frac{G^t}{P_a^t} * 100$$

Where:

$GPGR^t$ Gross Primary Graduation Ratio in school year **t**

G^t Number of primary graduates, in school year **t**

P_a^t Population of theoretical graduation age **a** in the last grade of primary, in school year **t**

Data required: Number of graduates in the last grade of primary education; population of the theoretical graduation age in the last grade of primary.

Data source: School register, school survey or census for data on graduates; population census or estimates for population of the theoretical graduation-age in the last grade of primary.

Type of disaggregation: By gender and geographical location (region, rural/urban).

Interpretation: A high ratio indicates a high degree of current primary education outputs.

Quality standards: Data on population used in deriving this indicator should refer strictly to the theoretical graduation age in the last grade of primary.

Limitations: As this calculation includes all graduates (regardless of age), the ratio can exceed 100%, due to over-aged and under-aged children who enter primary school for the first time early/late or/and repeat a grade. In some countries, the results of graduation might be driven by the availability of places in secondary education, so care should be taken in making comparisons.

EXPECTED GROSS PRIMARY GRADUATION RATIO (EGPGR)

Definition: Total number of new entrants to the first grade of primary in a given year, regardless of age, who are expected to graduate from the last grade of primary education, regardless of repetition, expressed as a percentage of the population at the official graduation age from primary education in the same year.

Purpose: To estimate the future outputs of primary education based on current new entrants to the first grade of primary education assuming current grade transition and repetition rates as well as last grade graduation probability remain unchanged. It therefore predicts the effect on last grade graduation of current education policies on entrance to primary education and future years of schooling.

Calculation method: Multiply the expected gross intake ratio to the last grade of primary education by the probability of graduation at the last grade of primary. This indicator is calculated on the basis of the reconstructed cohort method.

Formula:

$$EGPGR^{\,t} = EGIRLG^{\,t} \; X \; PG^{\,t}$$

Where:

$EGPGR^{\,t}$ Expected Gross Primary Graduation Ratio in school year **t**

$EGIRLG^{\,t}$ Expected Gross Intake Ratio in the last grade of primary in school year **t** (see Glossary for EGIRLG definition and formula)

$PG^{\,t}$ Probability of Graduation from the last grade of primary in school year **t**

$$PG^{\,t} = \frac{G^{\,t}}{NE^{\,t}_{\,l}}$$

Where:

$G^{\,t}$ Number of Graduates from the last grade of primary in school year **t**

$NE^{\,t}_{\,l}$ Number of new entrants in the last grade **l** of primary education, in school year **t**

Data required: Number of graduates in the last grade of primary education for year t; enrolment by grade for two consecutive years (years t-1 and t); number of repeaters by grade for year t; population of the official primary school-entrance age for year t.

Data source: School register, school survey or census for graduates, enrolment and repeaters; population census or estimates.

Type of disaggregation: By gender and geographical location (region, rural/urban). Care should be taken in calculating the indicator at sub-national level because pupils may transfer between localities.

Interpretation: A high ratio indicates a high degree of future primary education outputs.

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.

Limitations: Given that this indicator is estimated using **cohort analysis** models that are based on a number of assumptions (i.e. the observed flow rates will remain unchanged throughout the cohort life), care should be taken in using the results for cross-country comparisons. In some counties, the results of graduation might be driven by the availability of places in secondary education.

OUT-OF-SCHOOL CHILDREN-PRIMARY (OOS)

Definition: Children in the official primary school age range who are not enrolled in either primary or secondary schools.

Purpose: To identify the size of the population in the official primary school age range who should be targeted for policies and efforts in achieving universal primary education.

Calculation method: Subtract the number of primary school-age pupils enrolled in either primary or secondary school from the total population of the official primary school age range.

Data required: Population of the official primary school age range and number of pupils of primary school age enrolled in either primary or secondary school.

Data sources: School register, school survey or census for enrolment; population census or estimates.

Type of disaggregation: By gender and geographical location, (region, rural/urban areas).

Interpretation: The higher the number of out-of-school children, the greater the need to focus on achieving universal primary education. Some children of primary school-age who have never been in school may or may not eventually enrol as late entrants. Other children may have initially enrolled but dropped out before reaching the 'official' age of primary completion. When disaggregated by geographical location, this indicator can identify areas needing the greatest efforts. Policies can also focus efforts on priority population groups or a particular gender.

Quality standards: Enrolment count should include in all types of schools and education institutions, including public, private and all other institutions that provide organized educational programmes.

Limitations: Discrepancies between enrolment and population data coming from different sources may not give the exact magnitude of out-of-school children.

PROMOTION RATE BY GRADE (PR)

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

Purpose: To measure the performance of the education system in promoting pupils from a cohort from grade to grade, and its effect on the internal efficiency of educational systems. It is also a key indicator for analysing and projecting pupil flows from grade to grade within the educational cycle.

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

Formula:

$$PR_i^t = \frac{NE_{i+1}^{t+1}}{E_i^t}$$

Where:

PR_i^t Promotion Rate at grade **i** in school year **t**

NE_{i+1}^{t+1} New entrants to grade **i+1**, 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 enrolment and number of repeaters 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: By grade, gender, geographical location (regions, urban/rural) and type of institution (public/private).

Interpretation: Ideally, the rate should approach 100%; a high rate reflects high internal efficiency of the educational system. When compared across grades, the patterns can indicate specific grades for which there is low promotion.

Quality standard: Like other pupil-flow rates (repetition and dropout rates), the promotion 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. These flow-rates can be biased by: over-reporting enrolment/repeaters (particularly in grade one); incorrect distinction between new entrants and repeaters; pupil transfers between schools (at sub-national level).

Limitations: Automatic promotion 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 when comparing education systems.

DROPOUT RATE BY GRADE (DR)

Definition: Proportion of pupils from a cohort enrolled in a given grade at a given school year who are no longer enrolled in the following school year.

Purpose: To measure the phenomenon of pupils from a cohort leaving school without completion, 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: Dropout rate by grade is calculated by subtracting the sum of promotion rate and repetition rate from 100 in the given school year. For cumulative dropout rate in primary education, it is calculated by subtracting the survival rate from 100 at a given grade (see survival rate).

Formula:

$$DR_i^t = 100 - (PR_i^t + RR_i^t)$$

Where:

DR_i^t Dropout Rate at grade **i** in school year **t**

PR_i^t Promotion Rate at grade **i** in school year **t**

RR_i^t Repetition Rate at grade **i** in school year **t**

Data required: Enrolment by grade for school year t and enrolment and number of repeaters 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: By grade, gender, geographical location (regions, urban/rural) and type of institution (public/private).

Interpretation: Ideally, the rate should approach 0%; a high dropout rate reveals problems in the internal efficiency of the educational system. By comparing rates across grades, it is possible to identify those which require greater policy emphasis.

Quality standard: Like other pupil-flow rates (promotion and repetition rates), the dropout 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 when comparing education systems.

GROSS ENROLMENT RATIO IN EARLY CHILDHOOD CARE AND EDUCATION (GER/ECCE)

Definition: Total number of children enrolled in early childhood care and education programmes, regardless of age, expressed as a percentage of the population in the relevant official age group.

Purpose: To measure the general level of participation of young children in ECCE programmes. It also indicates a country's capacity to prepare young children for primary education.

Calculation method: Divide the total number of children enrolled in ECCE programmes, regardless of age, by the population in the relevant official age group in a given school year, and multiply by 100.

Formula:

$$\mathbf{GER}_{ECCE}^{t} = \frac{\mathbf{E}_{ECCE}^{t}}{\mathbf{P}_{ECCE}^{t}} * \mathbf{100}$$

Where,

$\mathbf{GER}_{ECCE}^{t}$ Gross enrolment ratio in ECCE programmes in school year **t**

$\mathbf{E}_{ECCE}^{t}$ Number of children enrolled in ECCE programmes in school year **t**

$\mathbf{P}_{ECCE}^{t}$ Population in relevant official age group concerned with ECCE in school year **t**

Data required: Total enrolment in ECCE programmes; population in the relevant official age group.

Data source: School register, school survey or census for data on enrolment; population censuses or estimates for school-age population normally obtained from the central statistical office.

Types of disaggregation: By gender and geographical location (region, urban/rural).

Interpretation: A ratio indicates adequate capacity for this type of programme within the country. A ratio approaching or surpassing 100% indicates that the country is, in principle, able to accommodate all children in the ECCE age group.

Quality Standards: The data on enrolment should cover both public and private institutions and programmes. Since gross enrolment does not take the age factor into account, children below 3 years and above 5 years (or whatever the official age group may be) will also be included. Therefore, gross enrolment can exceed 100 percent. Only countries that require official registration of any ECCE provision are likely to have official data for this indicator. Countries that have data only for public or state-supervised pre-school educational programmes will need to supplement these data with information on enrolment in other types of ECCE programmes, possibly through case studies and/or sample surveys.

Limitations: Enrolment data for ECCE programmes can be affected by differences in reporting practices, namely by the extent to which childcare programmes with little or no pedagogical component are included in the statistics. The distinction between ECCE programmes and organized, custodial childcare can be difficult to define in an internationally consistent way, especially with regard to very young children, for whom the natural pace of development limits the pedagogical possibilities. Countries may also differ widely in their approaches to ECCE, with some focusing on experiential education while others stress skill development, academic development, the visual arts, etc.

PERCENTAGE OF NEW ENTRANTS TO PRIMARY EDUCATION WITH ECCE EXPERIENCE.

Definition: Number of new entrants to primary grade 1 who have attended some form of organized early childhood care and education (ECCE) programme for the equivalent of at least 200 hours, expressed as a percentage of total number of new entrants to primary grade 1.

Purpose: To assess the proportion of new entrants to grade 1 who presumably have received some preparation for primary schooling through ECCE programmes.

Calculation Method: Divide the number of new entrants to grade 1 of primary education who have attended some form of organized ECCE programme by the total number of new entrants to primary grade 1 in a given school year, and multiply by 100.

Formula:

$$\%NE^t_{1,ECCE} = \frac{NE^t_{1,ECCE}}{NE^t_1} * 100$$

Where,

$\%NE^t_{1,ECCE}$ Percentage of new entrants to grade 1 of primary education in school year t who have attended some form of organized ECCE programme

$NE^t_{1,ECCE}$ Number of new entrants to grade 1 of primary education in school year t who have attended some form of organized ECCE programme

NE^t_1 Total number of new entrants to primary grade 1 in school year t

Data Required: New entrants to grade 1 of primary education who have attended some form of organized ECCE programme, and total number of new entrants to primary grade 1.

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

Types of disaggregation: By gender and geographical location (region, urban/rural).

Interpretation: A high percentage of new entrants to grade 1 of primary education who have attended some form of organized ECCE programme indicates that a large proportion of these children have participated in organized learning activities prior to entering primary school. Progress in schooling is often associated with cognitive abilities acquired at young ages. It is commonly recognized that prior participation in ECCE programmes can play an important role in a child's future education, because they shape attitudes toward learning and develop basic social skills, but the effect of ECCE activities on children's cognitive development may vary according to the programme attended.

Quality Standards: The percentage of new entrants to primary grade 1 who have attended some form of organized ECCE programme cannot exceed 100%. Obtaining data for this indicator will be a problem in many countries. Useful data may exist in school registration records, and school census instruments may also be geared to collecting this information. Otherwise, the data could be gathered through a sample survey of schools or through household surveys.

Limitations: This indicator may give an exaggerated picture of access to ECCE, since those children who have access to these programmes are also more likely to have access to primary schools.

PERCENTAGE OF TRAINED TEACHERS

Definition: Number of teachers who have received the minimum organized teacher training (pre-service or in-service) required for teaching at the specified level of education in the given country, expressed as a percentage of the total number of teachers at the same level of education.

Purpose: To measure the proportion of teachers trained in pedagogical skills, according to national standards, to effectively teach and use the available instructional materials. It reveals also a country's commitment to invest in the development of its human capital involved in teaching activities.

Calculation Method: Divide the number of teachers of the specified level of education who have received the minimum required teacher training by the total number of teachers at the same level of education, and multiply the result by 100.

Formula:

$$\%T_{h,c}^{t} = \frac{T_{h,c}^{t}}{T_{h}^{t}} * 100$$

Where,

$\%T_{h,c}^{t}$ Percentage of teachers of level of education h who have the required teacher training in year **t**

$T_{h,c}^{t}$ Total number of teachers of level of education h who have the required teacher training in year **t**

T_{h}^{t} Total number of teachers of level of education h in year **t**

Data required: Number of teachers for the specific level of education by training status.

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

Type of disaggregation: By level of education, type of institution (private/public) and geographical location (region, urban/rural).

Interpretation: A high percentage of teachers certified to teach in schools implies that a majority of the teaching force is trained and has the necessary pedagogical skills to teach and use the available instructional materials in an effective manner.

Quality Standards: Data should refer to teachers certified as having received adequate pre-service or in-service teacher training, or both. The percentage of certified teachers cannot exceed 100%. Teachers are persons who, in their professional capacity, guide and direct pupils' learning experiences in gaining the knowledge, attitudes and skills that are stipulated in a defined curriculum programme.

Limitations: This indicator does not take into account differences in teachers' experiences and status, teaching methods, teaching materials and variations in classroom conditions -- all factors that also affect the quality of teaching/learning. It should be noted that some teachers without this formal training may have acquired equivalent pedagogical skills through professional experience.

PUBLIC EXPENDITURE ON A SPECIFIC ISCED LEVEL AS % OF TOTAL PUBLIC EXPENDITURE ON EDUCATION

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

Purpose: To show the relative share of expenditure for a specific education level within overall public expenditure on education.

Calculation Method: Divide public expenditure devoted to the given level of education by total public expenditure on all levels of education, and multiply the result by 100.

Formula:

$$\%PXE_i^t = \frac{PXE_i^t}{\sum_{h=1}^{n} PXE_h^t} * 100$$

Where,

$\%PXE_i^t$ Public expenditure on a given level of education i as a percentage of total public expenditure on education in financial year **t**

PXE_i^t Public expenditure on a given level of education i in financial year **t**

PXE_h^t Public expenditure on education at level **h** in financial year **t**

Data required: Total public expenditure on education; public expenditure on the given 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: By level of administration and region.

Interpretation: A relatively high percentage denotes the priority given to that level in national educational policies and resource allocation. When interpreting this indicator, one should take into account the corresponding enrolment level, and then assess the relative current expenditure per pupil accordingly.

Quality Standards: This indicator should be based on consistent data on public expenditure for each level of education that cover public funding for both public and private educational institutions.

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

GENDER PARITY INDEX (GPI)

Definition: Ratio of female to male values of a given indicator.

Purpose: The GPI measures progress towards gender parity in education participation and/or learning opportunities available for women in relation to those available to men. It also reflects the level of women's empowerment in society.

Calculation Method: Divide the female value of a given indicator by that of the male.

Formula:

$$GPI_i^t = \frac{F_i^t}{M_i^t}$$

Where,

GPI_i^t Gender parity index of a given indicator i in year t

F_i^t Female value of a given indicator i in year **t**

M_i^t Male value of the same indicator i in year **t**

Data Required: Female and male values of the given indicator.

Data source: See source of the given indicator.

Type of disaggregation: By level of education, type of institution (private/public) and geographical location (region, urban/rural).

Interpretation: A GPI equal to 1 indicates parity between females and males. In general, a value less than 1 indicates disparity in favour of boys/men and a value greater than 1 indicates disparity in favour of girls/women. However, the interpretation should be the other way round for indicators that should ideally approach 0% (e.g. repetition, dropout, illiteracy rates, etc). In these cases, a GPI of less than 1 indicates a disparity in favour of girls/women and a value greater than 1 indicates a disparity in favour of boys/men.

Quality Standards*: See quality standards for the underlying indicators.

Limitations: The index does not show whether improvement or regression is due to the performance of one of the gender groups. Interpretation requires trend analysis of the underlying indicators.

YOUTH LITERACY RATE

Definition: The number of persons aged 15 to 24 years who can both read and write with understanding a short simple statement on their everyday life, divided by the population in that age group. Generally, 'literacy' also encompasses 'numeracy', the ability to make simple arithmetic calculations.

Purpose: To reflect recent outcomes of the basic education process. It is a summary measure of the effectiveness of the education system.

Calculation Method: Divide the number of people aged 15 to 24 years who are literate by the total population in the same age group and multiply the result by 100.

Formula:

$$\mathbf{LIT}^t_{15-24} = \frac{\mathbf{L}^t_{15-24}}{\mathbf{P}^t_{15-24}} * 100$$

Where,

$\mathbf{LIT}^t_{15-24}$ Literacy Rate of persons aged 15-24 years old in year **t**

$\mathbf{L}^t_{15-24}$ Literate Population aged 15-24 years old in year **t**

$\mathbf{P}^t_{15-24}$ Population aged 15-24 years old in year **t**

Data required: Population and number of literates (or illiterates) aged 15- to 24-years-old.

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

Types of disaggregation: By gender and geographical location (region, urban/rural).

Interpretation*:* A high literacy rate among the 15- to 24-year-olds suggests a high level of participation and retention in primary education, and its effectiveness in imparting the basic skills of reading and writing. Because persons belonging to this age group are entering adult life, monitoring their literacy levels is important with respect to national human resources policies, as well as for tracking and forecasting progress in adult literacy.

Quality Standards: The rate cannot exceed 100%. It is 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 the 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 the statistics.