4. Measuring equity for national education planning

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INTRODUCTION

This chapter presents evidence on the extent to which different indicators included in national education plans take account of equity as discussed in Chapters 2 and 3. It is fairly common to find equity measures in plans for indicators related to access at the primary level. But few national education plans include indicators for learning and, for those that do so, the main dimension of inequality included is sex. Where plans do include measures of equity, these are most often associated with impartiality in that they track sub-groups of the population separately or assess parity between these sub-groups. This chapter highlights positive country examples for tracking progress to achieve equity in access and learning.

It then highlights the importance of including a wider range of dimensions of disadvantage within education plans, discusses what data need to be collected and proposes methods to track progress to identify how inequalities have changed over time. The chapter aims in particular to advise policymakers on what information should be taken into account when deciding on the types of indicators that are suitable for tracking progress on learning.

4.1 MEASURING EQUITY WITHIN NATIONAL EDUCATION PLANS

Our analysis of national education plans identifies the presence of equity dimensions included in indicators for tracking progress towards access and learning at different education levels. It further looks at how these equity dimensions relate to the indicators set in SDG 4, with a focus on the pre-primary, primary and secondary levels as set out in SDG Targets 4.1 ("by 2030, ensure that all girls and boys complete free, equitable and quality primary and secondary education leading to relevant and effective learning outcomes") and 4.2 ("by 2030, ensure that all girls and boys have access to quality early childhood development, care and pre-primary education so that they are ready for primary education").

Taking into account the lessons from Chapters 2 and 3, this chapter acknowledges the gap between the types of approaches that are ideally expected, and the reality of what is currently being adopted by most countries, with a focus on those furthest away from SDG Targets 4.1 and 4.2.

National education plans are the main tool that most governments use to plan and implement their policy agenda. In this chapter we assess the types of indicators being used for measuring learning at different education levels and whether equity elements are included. We draw some lessons from countries currently implementing plans to measure equity in learning and in education.

4.1.1 Methodology

Countries were selected from all regions as defined for SDG monitoring.[26] Countries that did not have a plan since 2004 were omitted.[27] Of the 75 countries identified, 34 were from sub-Saharan Africa, 8 from Northern Africa and Western Asia, 9 from Latin America and the Caribbean, 9 from Central and Southern Asia, 5 from Eastern and South-Eastern Asia, 8 from Oceania, and 2 from Europe and Northern America *(see **Annex B**).* As a starting point, we reviewed 52 national education plans available on the Global Partnership for Education (GPE) website. We then broadened geographical coverage with 23 additional plans, ensuring that examples of education plans in English, French, Portuguese and Spanish were included.[28]

We produced a template to record country data on indicators associated with access to education and learning (related to SDG Targets 4.1 and 4.2) and their characteristics, including information on equity. Recognising that national education plans are organized in different ways, with varying amounts of detail, we adopted a common approach for seeking relevant information to complete the template.[29] The protocol involved the following steps:

1. Review the plan looking at the document structure and contents, identifying the information of interest (or at least part of it). Highlight any relevant information.

2. Search for agreed keywords in the text in order to find out where relevant topics and specific information of interest are located.

3. Read in more detail sections which contain information about goals, targets and indicators for the topics of interest.

4. Highlight those paragraphs or tables of interest which contain relevant information, so that it can be analysed and extracted.

5. Review the text again, focusing on the titles and highlighted text to get a sense of how much of the information that needs to be included in the template is available and what information is missing.

6. Search through the text again using keywords to locate missing information.

7. Complete the template by education level or by type of indicator.

4.1.2 Indicators included in national education plans

Access

Indicators for tracking progress on access to education that are most commonly found in national education plans relate to participation and completion at each education level. In general, indicators for participation included in national education plans relate to the ones in the SDG list of thematic indicators for Targets 4.1 and 4.2[30] but are less comprehensive as they usually focus just on enrolment and completion rates rather than the complete list of indicators detailed in those targets *(see **Table 4.1)*.[31]

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26 Each country was assigned to the corresponding region according to the United Nations SDGs Regional Grouping Map (United Nations Statistics Division, 2017).

27 In this case we referred mostly to documents named "national education plans", "national strategies" or similar, usually published by the Ministry of Education of each country. In the final sample of countries, the years covered vary between 2004 and 2017.

28 Given time and resource restrictions, we were unable to include plans in other languages.

29 The template was completed with the support of the UIS.

30 For a full list of the indicators to monitor the progress toward SDG 4 on education, see the global and thematic indicator frameworks in UNESCO (2016b) or visit the UIS website (http://uis.unesco.org/en/topic/sustainable-development-goal-4).

31 In particular, from the list of 6 thematic indicators related to participation (and completion) in SDG Targets 4.1 and 4.2, those usually found in national education plans are the following: gross intake ratio to the last grade (primary, lower secondary education), completion rate (primary, lower secondary, upper secondary education), and gross early childhood education enrolment ratio (pre-primary education, early childhood educational development). However, the following indicators are rarely found: percentage of children over-age for grade (primary, lower secondary education), out-of-school rate (primary, lower secondary, upper secondary education), and participation rate in organized learning (one year before the official primary entry age).

Table 4.1 Indicators included in national education plans

	Among global and thematic indicators for SDG 4?	Equity?	Dimension			
			Sex	Location	Wealth	Disability
Learning						
Percentage of students proficient in reading for an education level						
Percentage of students proficient in mathematics for an education level						
Percentage of students achievieng minimum grade/score in national examinations	Yes	Yes	–	0	0	0
Percentage of students passing national examinations at the end of each education level		Yes	–	0	0	0
Percentage of studens achieving ninimum proficiency level (reading and mathematics) at end of the grade/education level	Yes	Yes	–	0	0	0
Learning achievement rates in examinations improved to "x %" by year "y"		Yes	–	0	0	0
Average percentage of correct answers in national examinations (reading and mathematics)						
Access: Participation						
Number of new entrants per education level		Yes	+	–	0	–
Gross enrolment ratio	Yes	Yes	+	–	0	–
Net enrolment rate		Yes	+	–	0	–
Gender parity index	Yes	Yes	–	0	0	0
Access: Completion						
Retention rate per grade or education level*						
Drop out rate by grade/education level		Yes	–	0	0	0
Survival rate by education level						
Completion rate by education level	Yes	Yes	++	0	0	0
Transition rate to next education level		Yes	–	–	0	0
Free Education						
Education provision per education level guaranteed for all by year "x"						
Abolish fees for education level "x" by year "y"						
Number of years of compulsory schooling	Yes, under the category "participation"					

Notes: ++ High frequency indicators: indicators most commonly found in the different education levels when compared to other indicators for the same category (i.e. learning, access, free education) in the reviewed national education plans.
+ Frequent indicators: indicators commonly found in the different education levels when compared to other indicators for the same category (i.e. learning, access, free education) in the reviewed national education plans.
- Low frequency indicators: indicators least commonly found in the different education levels when compared to other indicators for the same category (i.e. learning, access, free education) in the reviewed national education plans.
0 Indicators: indicators not found or almost not found in the different education levels when compared to other indicators for the same category (i.e. learning, access, free education) in the reviewed national education plans.

Source: Authors' analysis of 75 national education plans.

Some of the indicators for participation included in national plans are more prevalent than others. The most common are gross enrolment ratios and net enrolment rates. Very few national plans include measures to track the number of children out of school, which would provide an indication of the scale of the challenge in absolute terms. Sierra Leone's national plan includes an indicator for the percentage of children aged 6 to 11 who have never attended school, aiming to reduce this from 23% in 2010 to 5% by 2018.[32] Uzbekistan's plan measures participation rates in alternative programmes of education for students out of school. Even so, some countries do show concern for incorporating students who are out of primary school due to, for instance, their remote location or armed conflict. Such countries usually establish specific targets for students affected by armed conflict (such as Afghanistan and Mali) or define explicit indicators for participation of students in rural areas (as in the case of Somalia and Niger).[33]

The education plans reviewed are not generally explicit about indicators for tracking progress for over-age children as recommended by the SDGs. Yet from an equity perspective, such indicators are important. Evidence shows that being above the official school age is both most prevalent among more disadvantaged children and detrimentally related to the ability of children to complete a full cycle of primary school. In some contexts, it is also related to learning deficits (Lewin and Sabates, 2012).

More generally, access indicators tend to focus on the whole population at the given education level, rather than providing dimensions of equity for tracking progress by different population groups. As such, they apply minimum standards rather than an impartiality approach to equity (see Chapter 2). Among the 75 countries reviewed, a large majority provide indicators related to participation (87% of countries at the primary level and 83% at the secondary level); 73% of countries include indicators for completion of primary education and 63% of secondary education.

In education plans, participation and completion indicators feature more heavily than learning indicators (see **Figure 4.1**). Around 50% of these include indicators with an equity dimension for participation at each level, with a much smaller proportion doing so for completion (27% for primary and 21% for secondary education).

The Somalian case is especially interesting with respect to tracking progress according to equity. This country's national education plan includes measures for disaggregating enrolment information by sex, disability, special needs and location. Somalia has measured some of these indicators in the past, and thus has a baseline, which allows it to produce more accurate targets, for example:[34]

- In general, for access to primary education: "By 2016, at least 75% of children aged between 6 and 13 years are enrolled in basic primary education."[35] (p. 25)
- By student location: "By 2016, the nationwide rural-urban disparity in primary enrolment will be less than 20%."[36] (p. 25)
- By student type of community: "Increase the participation of children of pastoralist communities from about 10% to at least 40% by 2015." (p. 34)
- By sex: "Increase the enrolment of girls from the present estimate of 38% to 50% of the total primary school population by 2015." (p. 34)

32 Ministry of Education, Science and Technology, Government of Sierra Leone (2013). Education Sector Plan 2014-2018. Learning to Succeed (p. 23).
33 For Somalia, only data from the Somaliland plan were included in the analysis.
34 See Ministry of Education and Higher Education, Republic of Somaliland (2013). Somaliland's Education Sector Strategic Plan 2012-2016.
35 "Basic primary education" refers to primary education in Somaliland's education system.
36 The data set used to measure net enrolment rates in 2011 were the Primary School Census 2011/2 results, which was conducted across 13 regions in Somaliland in October 2011, with the support of UNICEF.

Figure 4.1 In education plans, participation and completion indicators feature more heavily than learning indicators

Proportion of countries with indicators for access and learning by school level and availability of equity dimensions (out of 75 countries)

■ Indicator with equity dimension　　■ Indicator without equity dimension　　■ No indicator
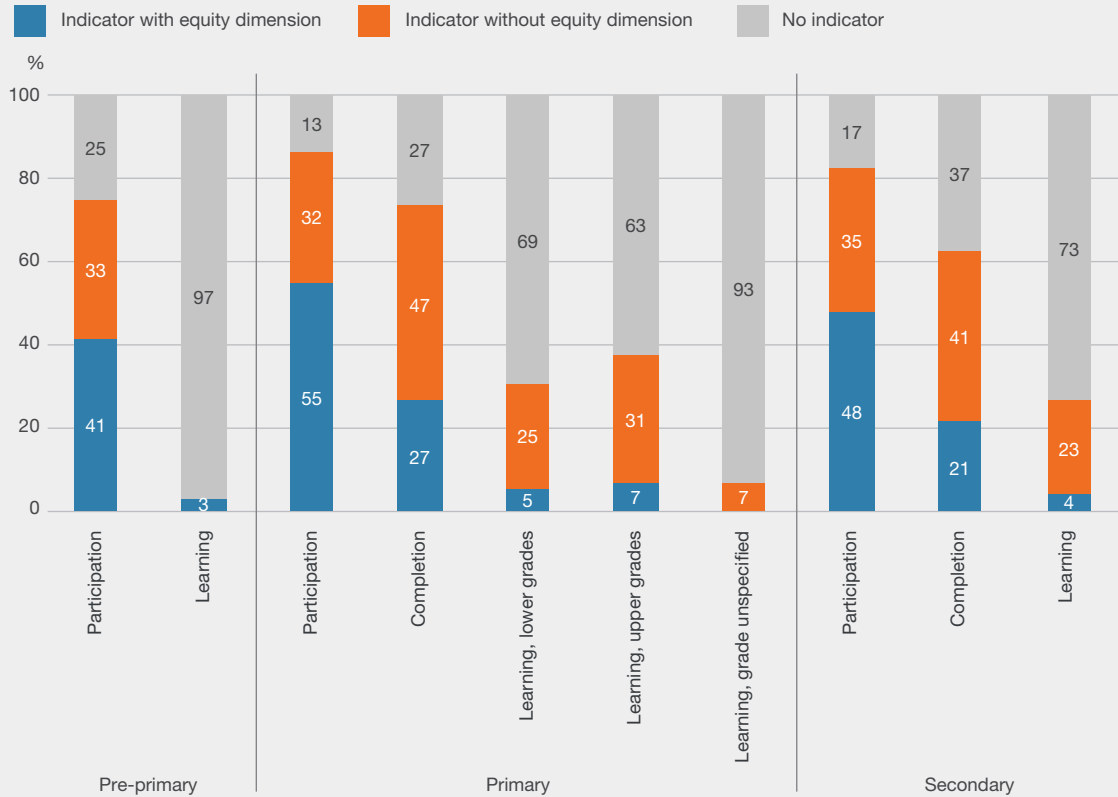
Source: Authors' review of 75 national education plans.

- By student disability: "Improve the participation of male and female children (aged 6-17 years) with disabilities and those in need of special care and protection (particularly girls) to more than 40% of their share of the population by 2015."[37] (p. 34)

In most countries, student wealth or socioeconomic status does not seem to be widely used for tracking progress for access. For instance, in primary education, only Rwanda and Zimbabwe include such indicators. In Zimbabwe's case, the attendance rate of the poorest quintile in primary education is expected to rise to 94% by 2019. The country uses data from

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37 This indicator refers to children in school age (6 to 17 years in Somalia). Target groups of learners with special education needs include learners with hearing impairments; visual impairments; physical disabilities; cerebral palsy; epilepsy; mental disabilities; Down syndrome; autism; behaviour, emotional and social difficulties; specific learning difficulties/learning difficulties; speech and language difficulties; multiple disabilities; chronic health problems; learners who are gifted and talented; and learners who are deaf and blind.

the Multiple Indicator Cluster Survey[38] that had a baseline of 90.4% in 2014.[39]

In the case of Rwanda, the plan refers to the EICV3[40] household survey showing that, among primary school-aged children out of school, most are from poorer households or living in rural areas. According to EICV3 data, primary education attendance rates are 9% higher in the richest consumption quintile compared with the lowest quintile.[41]

These examples use household surveys to track progress according to wealth. One reason why some national education plans do not include such indicators is because, where they rely on administrative data to enable them to track progress, these usually do not provide disaggregated data for these groups. Section 4.2 discusses the type of data needed for such tracking, notably the importance of linking school administrative data usually available through education management information systems (EMIS) with household survey data.

Although it is not straightforward to measure, completion of primary or secondary education cycles is commonly recognised as an important indicator for tracking progress. The two measures recommended for SDG 4.1, namely the gross intake ratio to the last grade (in primary and lower secondary education) and the completion rate (for primary, lower and upper secondary education) are used in some national education plans. Most of the countries that do include a completion rate have more recent plans, drawn up since 2011.[42] The definition of the completion rate is not usually very explicit, and often the calculation method is not identified in the plan, so it is not possible to verify whether the definition of these indicators is in accordance with that included in the SDG monitoring framework.[43]

Mozambique is one example of a country that produces a completion rate. Its 2013 plan identifies a "Gross Primary Education Completion Rate"[44] of 49% for all students and 45% for male students by 2010. The plan expects to achieve 54% and 51% respectively by 2015.[45] Nicaragua has set completion rate targets of 85% in 6th grade and 62% in 9th grade by 2015, with baseline values of 72% and 50% respectively in 2010.[46] In addition, Rwanda's 2013 national education plan aims to increase the primary completion rate from 72.7% in 2012 to 75% in 2018.[47]

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38 The Zimbabwe Multiple Indicator Cluster Survey (MICS) was carried out in 2014 by the Zimbabwe National Statistics Agency (ZIMSTAT) as part of the global MICS programme, with technical and financial support by the United Nations Children's Fund (UNICEF).

39 Ministry of Primary and Secondary Education, Republic of Zimbabwe (2015). Education Sector Strategic Plan 2016-2020 (p. 52).

40 The third Integrated Household Living Conditions Survey or Enquête Intégrale sur les Conditions de Vie des ménages (EICV3).

41 Republic of Rwanda (2013). Education Sector Strategic Plan for 2013-2018 (p. 24).

42 Countries with a completion rate include Bangladesh, Botswana, Brazil, Cambodia, Congo, Eritrea, Gambia, Georgia, Ghana, Guinea-Bissau, Haiti, Honduras, Kenya, Lesotho, Liberia, Mali, Mauritania, Mozambique, Myanmar, Nicaragua, Niger, Nigeria (Kano State), Papua New Guinea, Philippines, Rwanda, Sao Tome and Principe, Sierra Leone, Solomon Islands, Somalia, South Africa, Sudan, Uganda, Zambia and Zimbabwe.

43 For instance, in the SDG monitoring framework, the "completion rate for primary education" is defined as: "Percentage of a cohort of children or young people aged 3-5 years above the intended age for the last grade of primary education who have completed that grade. The intended age for the last grade of primary education is the age at which pupils would enter the grade if they had started school at the official primary entrance age, had studied full-time and had progressed without repeating or skipping a grade."

44 According to Mozambique's national plan: "This indicator relates to the number of children completing primary education (Grade 7, daytime and evening classes, public, private and community education), irrespective of their age (nominator), with a 12-year-old population (denominator)" (p. 31).

45 Ministry of Education, Republic of Mozambique (2013). Education Strategic Plan 2012-2016 (p. 136).

46 Ministerio de Educación, República de Nicaragua (2011). Plan Estratégico de Educación 2011-2015 (p. 61). Information on how the completion rate is calculated is not included in the national plan.

47 Ministry of Education, Republic of Rwanda (2013). Education Sector Strategic Plan for 2013-2018 (pp. 21 and 36). The plan does not define how the primary completion rate is calculated.

Figure 4.2 The majority of equity indicators for participation focus on sex

Number of countries including indicators for participation in primary and secondary education by equity dimension (out of 75 countries)
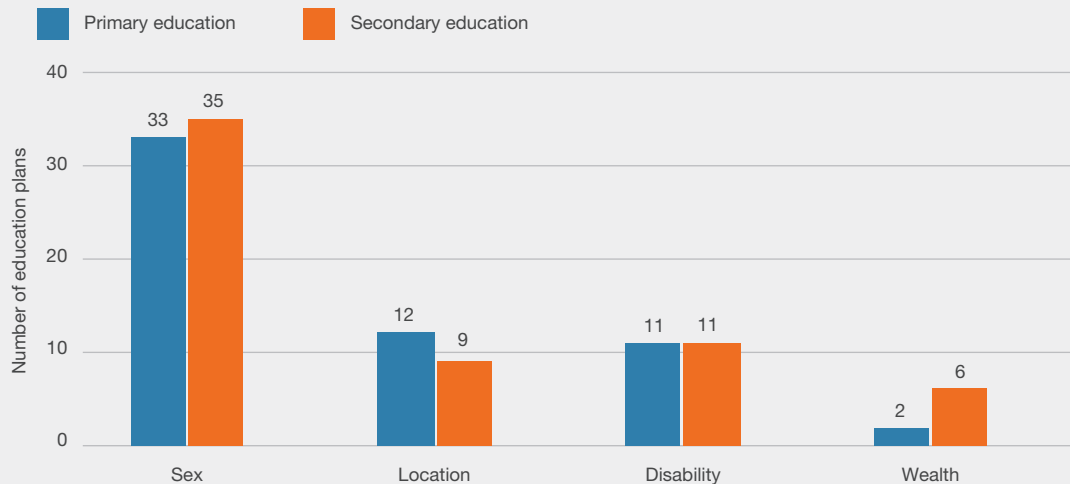
Source: Authors' review of 75 national education plans.

With respect to the dimensions of equity included for indicators to measure participation and completion, sex is again the most frequent *(see Figures 4.2 and 4.3).* Only five countries include location as an indicator of equity for completion of primary school and only two countries include in their plan regional differences for completion of secondary school. None of the education plans reviewed incorporated wealth as an equity dimension for completion of primary or secondary cycles of education.

Cambodia and Sierra Leone's education plans incorporate location as a criterion for disaggregating completion rates in secondary education. Cambodia's 2014 plan stipulates that by the academic year 2017/18, 17 provinces should have achieved lower secondary completion rates of at least 40%, with a baseline of 7 provinces in 2012/13.[48] Sierra Leone's 2013 plan states that the Ministry of Education expects that by 2018, "the Completion Rate is 75% by location and gender" (from 57% for the whole population in 2011)[49], although it is not clear from the national plan what categories were defined for location and what definition of completion rate was used.

Guinea is an example of a country that intends to track progress in primary school completion by both location and sex. The country's 2014 plan identifies the starting point and target for the following indicators:[50]

48 Ministry of Education, Sport. Kingdom of Cambodia (2014). Education Strategic Plan 2014-2018 (p. 13).
49 Ministry of Education, Science and Technology, Government of Sierra Leone (2013). Education Sector Plan 2014-2018. Learning to Succeed.
50 See Tableau 24: Indicateurs de résultats du PSE in Republic of Guinea (2014). Programme Sectoriel de l'Education 2015-2017 (p. 87).

Handbook on Measuring Equity in Education

Figure 4.3 Among equity indicators on completion, sex dominates

Number of countries including indicators for completion by equity dimension (out of 75 countries)
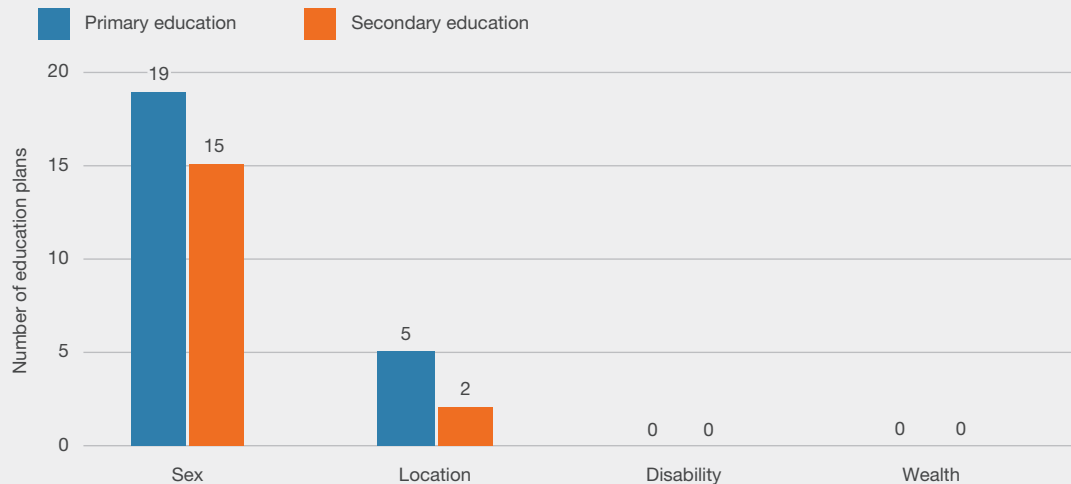
Source: Authors' review of 75 national education plans.

- Completion rate[51] in primary education (all students): 70.7% by 2017 (baseline 58.5% in 2013).
- Completion rate in primary education (female students): 62.2% by 2017 (baseline 50.9% in 2013).
- Completion rate in primary education (students in rural areas): 50.5% by 2017 (baseline 42.3% in 2013).

Fewer education plans incorporate indicators for access to pre-primary education than for access to primary and secondary education. Three-quarters of the 75 countries include indicators for access at the pre-primary level. However, only 41% include equity dimensions *(see Figure 4.1)*. This is despite evidence that inequalities will widen over the lifecycle, unless they are tackled even before children start primary school (Alcott and Rose, 2017).

Overall, indicators measuring equity with respect to participation and completion are usually limited in national education plans. Where these are included, they most frequently relate to sex and regional dimensions and, in just a few cases, to disability or wealth. The equity indicators in national education plans tend to relate to achieving minimum standards. In the few cases where a particular population has been singled out for improving equity in educational access, indicators usually refer to the absolute and relative targets for such populations.

Parity indices, associated with impartiality measures of equity as identified in Chapter 2, are fairly common in national education plans. While these can be useful for identifying whether population groups have access to the same opportunities, parity indices have limitations as they do not show whether the overall level reached for all population groups is sufficient. For example, parity can be reached by the rich and poor

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51 The definition of completion rate is not detailed in Guinea's education plan.

segments of the population even though both may have extremely low participation rates.

As an example, Sudan's 2012 education plan identified a goal of 0.95 for the gender parity index for primary education by 2016, with a baseline of 0.9 in 2010.[52] However, the primary gross enrolment ratio for 2010 was 71%, suggesting gender parity could be achieved while a large number of both boys and girls are not in school.

Uganda's 2013 education plan reports the country had achieved a gender parity index of 0.99 by 2008, which means that there is gender parity in access at the national level. However, according to the plan, national averages mask regional disparities and in many areas girls' participation is still low. Also, the completion rate of primary school for girls in Uganda is lower than for boys, and fewer girls than boys sat examinations at the end of primary school.[53]

Learning

Raising learning levels equitably at all education levels is one of the central objectives of the SDG agenda. Yet there is a striking lack of indicators for learning stipulated in national education plans, and in cases where indicators for learning are included, there is little reference to equity. At the primary level, where education indicators are most prevalent, only 37% of the 75 countries have an indicator for learning in the upper grades of the primary school cycle and just 7% of these countries have indicators for equity in learning at this *level (see Figure 4.1)*. Three additional countries – Honduras, Nicaragua and Somalia – have learning indicators for primary schooling but do not specify the grade to which their indicators pertain. The lack of learning targets corroborates findings from similar analysis conducted for the EFA Global Monitoring Report and the Global Education

Monitoring Report (UNESCO, 2012; UNESCO, 2016a).

It could be argued that the lack of learning indicators in national education plans stems from the neglect of learning in the MDGs, which only focused on primary school completion. Countries with recent education plans are starting to include learning indicators. However, this is not consistent across all countries that have recently prepared their education plans. Of the eight plans included in the analysis that were produced since 2015, five include a learning indicator, only two of which are disaggregated by sex, as the only equity dimension.[54]

4.1.3 At what stages in the education cycle is equity in learning being measured?

Most countries refer to their national examinations as the basis for tracking progress in learning. This is usually done at the end of the primary or secondary school cycles. In some countries, however, national examinations are used to track progress in learning at earlier grades of primary school. For instance, Lesotho, Mexico and South Africa have one standardised examination at the end of the 3rd grade and a second one in the 6th grade, which coincides with the end of primary school.

El Salvador, Ethiopia, Honduras, Niger and Rwanda use national assessments in more than one grade of primary education. Ethiopia's 2015 national plan, for example, tracks progress on standardised examinations in different grades. The national plan measures learning achievement and sets equity targets by disaggregating measures for males and females for the indicator "percentage of students who achieve 50% and above (composite score) in the National Learning Assessment (NLA)", for students in Grades 4, 8, 10 and 12 separately. Ethiopia's plan

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52 Ministry of General Education, Republic of Sudan (2012) p. 37.
53 Ministry of Education and Sports, Government of Uganda (2013). Education Sector Plan 2010-2015, p. 26.
54 Ethiopia and Mali.

identifies that the baseline measure for the Grade 4 learning indicator was 25% in 2012, which meant that 25% of students in 2012 achieved 50% and above in the composite score in the NLA. Including this baseline indicator is important to enable the government to set realistic targets for improving learning over time. The Ethiopian national education plan additionally includes the target of 50% of boys and 50% of girls achieving 50% and above in the NLA in Grades 4 and 8 by 2017, and 50% of boys and 50% of girls achieving 50% and above in the NLA in Grades 10 and 12 by 2019.[55]

The analysis of national education plans shows that 28 of the 75 countries include indicators for learning at the end of primary school *(see Figure 4.1).* A total of 23 education plans include indicators for learning at earlier grades of primary school. As mentioned previously, this is important because tracking progress from an early stage is key to ensuring that inequality gaps are tackled before it becomes more difficult and costly to do so (Rose and Alcott, 2016). But while some education plans include indicators for learning at early stages of primary school and at the end of the primary school cycle, equity in learning is mostly neglected. Of the 28 education plans with indicators for learning at the end of primary school, only 5 include disaggregation by equity dimensions.[56] Of the 23 education plans with indicators for learning in the early grades of primary school, only 4 include equity dimensions.[57]

National education plans that include targets for learning contain several types of indicators (*see Tables 4.2 and 4.3*). The most common indicators are average achievement rates and percentage

of students reaching a certain score or level of proficiency in national assessments, mostly measuring literacy and numeracy. In 13 of the 75 national education plans reviewed, learning targets are measured by the proportion of the student population achieving a certain minimum proficiency level at the end of the first and second cycles of primary school. This is a measure of impartiality as outlined in Chapter 2, Table 2.2.

Some similarities are found between these common indicators and those included in the thematic indicator framework for SDG 4-Education 2030 (UNESCO, 2016b). Some countries use indicators for learning by measuring the proportion of students achieving a minimum level of proficiency in literacy and numeracy, similar to SDG Indicator 4.1.1.[58] However, very few countries incorporate disaggregation for these indicators by sex, location and wealth, as recommended for SDG monitoring. When any dimension of equity in learning is used, sex is by far the most common.

Despite the strong evidence on the importance of tackling inequalities in learning early on that has been noted, of the 75 countries only Cameroon and Niger include an indicator related to learning at the pre-primary level *(see Figure 4.1).* However, neither country disaggregates for tracking progress by any equity dimension at this level. In Niger's 2013 national plan,[59] the proportion of students achieving the basic competences[60] to successfully start primary education is included as an indicator, with a goal of reaching 80% by 2024.

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55 Federal Ministry of Education, The Federal Democratic Republic of Ethiopia (2015). Education Sector Development Programme V (2015) (p. 127).
56 Benin, Ethiopia, Mexico, Samoa and Zimbabwe.
57 Chad, Mexico, Samoa and Zambia.
58 SDG Indicator 4.1.1 is the "proportion of children and young people (a) in grades 2/3; (b) at the end of primary; and (c) at the end of lower secondary achieving at least a minimum proficiency level in (i) reading and (ii) mathematics, by sex" (United Nations, 2017).
59 République du Niger (2013). Programme Sectoriel de l'Education et de la Formation (2014-2024), p. 69.
60 The plan does not include the competences assessed or offer more detail about this evaluation at the end of pre-primary education.

Table 4.2 Indicators of learning, by dimensions of equity, for lower grades of primary education in national education plans

Indicators for learning	Any	None	Sex	Location	Disability	Wealth
Percentage of students proficient in reading	3	2	1	0	0	0
Percentage of students proficient in mathematics	2	1	1	0	0	0
Percentage of students achieving minimum grade/score in national examinations	2	1	1	0	0	0
Percentage of students passing national examinations in the lower grades of primary education	0	0	0	0	0	0
Percentage of students achieving minimum proficiency level (on reading and mathematics) at the end of the grade/education level	13	11	2	0	0	0
Learning achievement rates in examinations improved to "x %" by year "y"	5	5	0	0	0	0
Average percentage of correct answers in national examinations (reading and mathematics)	2	2	0	0	0	0

Note: Columns show number of plans with this type of indicator (out of 75 country plans).
Source: Authors' review of 75 national education plans.

Table 4.3 Indicators of learning, by dimensions of equity, for upper grades of primary education in national education plans

Indicators for learning	Any	None	Sex	Location	Disability	Wealth
Percentage of students proficient in reading	1	1	0	0	0	0
Percentage of students proficient in mathematics	1	1	0	0	0	0
Percentage of students achieving minimum grade/score in national examinations	6	4	2	0	0	0
Percentage of students passing national examinations in the upper grades of primary education	3	1	1	1	0	0
Percentage of students achieving minimum proficiency level (on reading and mathematics) at the end of the grade/education level	11	9	2	0	0	0
Learning achievement rates in examinations improved to "x %" by year "y"	9	9	0	0	0	0
Average percentage of correct answers in national examinations (reading and mathematics)	1	1	0	0	0	0

Note: Columns show number of plans with this type of indicator (out of 75 country plans).
Source: Authors' review of 75 national education plans.

Handbook on Measuring Equity in Education

Cameroon seeks to measure the proportion of students achieving over 20 points in a future national examination, expecting 66% of its students to attain this result by 2020. In 2013, there was still no baseline measure for this test in the national plan, as the examination had not yet been implemented.[61]

At the secondary level, only 20 of the 75 countries track learning, and only Ethiopia, Mexico and Somalia include disaggregation by equity *(see **Table 4.4**)*. In these three cases, disaggregation is by sex. For the national education plans that include measures of learning in secondary school, the three main indicators are: pass rates in examinations at the end of the secondary school cycle, average achievement rates in national examinations, and percentage of students achieving a minimum level of performance or certain proficiency level in national examinations,

which usually take place at the end of secondary school. This is a measure of minimum standards *(see Chapter 2).*

Most countries that include indicators for learning at the secondary level cover the subjects of mathematics and reading in the main national language or languages (in cases when two or more languages are spoken). Some go beyond this; for instance, Malaysia and Samoa include English as a foreign language, and Guyana and Niger cover science in national examinations. Ethiopia includes physics, biology and chemistry in its national learning assessment.

Some of these countries also include learning targets for these subjects (although none of them include equity dimensions). For instance, the

Table 4.4 Indicators of learning, by dimensions of equity, for secondary education in national education plans

Indicators for learning	Any	None	Sex	Location	Disability	Wealth
Percentage of students proficient in reading	0	0	0	0	0	0
Percentage of students proficient in mathematics	0	0	0	0	0	0
Percentage of students achieving minimum grade/score in national examinations	5	3	2	0	0	0
Percentage of students passing national examinations at the end of secondary education	5	5	0	0	0	0
Percentage of students achieving minimum proficiency level (on reading and mathematics) at the end of the grade/education level	3	3	0	0	0	0
Learning achievement rates in examinations improved to "x %" by year "y"	9	8	1	0	0	0
Average percentage of correct answers in national examinations (reading and mathematics)	1	1	0	0	0	0

Note: Columns show number of plans with this type of indicator (out of 75 country plans).
Source: Authors' review of 75 national education plans.

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61 Ministry of Economy, Planning and Regional Development, Republic of Cameroon (2013). Document de Stratégie du Secteur de l'Education et de la Formation (2013-2020), p. 111.

Malaysian education plan includes the following target: "By the end of Form 5 (Grade 11), 90% of students will score a minimum of a Credit in SPM [the Malaysian Certificate of Education] Bahasa Malaysia, and 70% in SPM English (against Cambridge 1119 standards) by 2025."[62] In the case of Guyana, targets for the Caribbean Secondary Education Certificate are included, with the percentage pass rate of Grades 1 to 3 mathematics, English and science in public secondary schools targeted to improve to 60% by 2018.

In sub-Saharan Africa, 18 out of 34 countries included in the review have indicators of learning either for lower or upper primary school, and only 7 of these intend to track progress by any dimension of equity at these levels: Benin, Cameroon, Ethiopia, Mali, Somalia, Zambia and Zimbabwe. Of these seven education plans, three were launched in 2015 or later, and none of them before 2011.

Where dimensions of equity in learning are covered in national education plans, disaggregation by sex is by far the most common. None of the 75 countries reviewed tracks equity in learning according to students' wealth or disability status.

Although it ought to be possible for national assessments to track progress by geographical disparities in learning, Zimbabwe is the only country among those reviewed that takes location into account. It is also notable that this is a rare example of including disaggregation by two dimensions simultaneously: sex and location. Zimbabwe's 2016 national education plan commits to specific targets in learning for students from different districts. In addition to specifying that by 2020, Zimbabwe expects to have a Grade 7 pass rate of 54% for all students (53% for boys and 55% for girls),[63] the plan

further stipulates that by the same year, 45 out of 72 districts will achieve a Grade 7 pass rate of 50% or more in mathematics. With respect to disaggregation by sex, 40 districts are targeted to achieve a pass rate of 50% or more in mathematics for boys and 46 are expected to do so for girls.[64]

Six of the nine countries in Latin America that were reviewed include measures of learning at the primary level,[65] although only Mexico measures equity in both lower and upper primary levels. The Mexican National Institute for Educational Assessment applies the national standardised examination (EXCALE) to a representative sample of students at the end of pre-primary education, in the 3rd and 6th grades of primary education, and in the 3rd grade of secondary education. By assessing the same cohorts of students over time, it is possible to track progress during their school years. EXCALE provides information on baseline measures of learning and progress in learning. It includes an indicator tracking the proportion of students achieving levels of learning defined as "below average" for language and mathematics, and has defined specific targets for each grade, which include disaggregation by sex. For example, for the indicator "Percentage of students achieving learning levels equivalent to "below average" in EXCALE national examination in mathematics and Spanish", the goal was a maximum of 10.1% of female students in mathematics by 2018.[66] There are also future learning targets, which are obtained using predictions from the EXCALE data.

In the eight countries from Northern Africa and Western Asia for which education plans were analysed, only Armenia and Yemen measure educational achievement using international assessments. In both cases, they refer to the Trends in International Mathematics and Science Study

62 Ministry of Education, Malaysia (2013). Education Blue Print 2013-2025, p. E12.
63 Ministry of Primary and Secondary Education, Republic of Zimbabwe (2016). Education Sector Strategic Plan 2016-2020, p. 92.
64 Ibid.
65 Namely, Brazil, El Salvador, Guyana, Honduras, Mexico and Nicaragua.
66 Secretaría de Educación Pública, Estados Unidos Mexicanos (2013). Programa Sectorial de Educación 2013-2018 (p. 82).

Box 4.1 The Global Partnership for Education's approach to measuring equity in education planning

The Global Partnership for Education (GPE)'s strategic plan (Vision 2020) emphasises the importance of developing credible education sector plans to support stronger education systems that are equipped to deal with the challenges of equity, efficiency and learning. To this end, its recently elaborated Results Framework includes a series of indicators that enable the measurement of progress towards sector goals across its developing country partners. Key among these is a methodology for assessing the proportion of education plans that include a robust equity strategy capable of responding to the particular issues faced by marginalised groups.

Baseline data to inform this GPE Results Framework indicator were collected from 19 education plans endorsed in 2015 and 2016, including national education plans from Bangladesh, Cambodia, Central African Republic, Congo, Guinea, Guyana, Haiti, Kenya, Mali, Mozambique, Rwanda, and Togo, as well as five state-level education plans from Nigeria and two from Pakistan.

Of the 19 plans reviewed, most considered equity from a broad perspective, identifying strategies for an average of six marginalised populations *(see Table 4.5)*. The most commonly cited were children with disabilities, girls, children from the poorest households and children from rural/remote areas. GPE methodology focuses on the equity strategy needed to address whichever group is identified as being most marginalised: usually girls (47% of plans) and children from rural/remote areas (26% of plans).

Table 4.5. Frequency with which specific marginalised groups were cited in 19 education plans

	Number of plans with a strategy for group	Number of plans where group was identified as most marginalised
Children with disabilities	18	1
Girls	17	9
Children from the poorest households	16	2
Children in rural/hard-to-reach/remote areas	14	5
Orphans	8	0
Ethnic and/or linguistic minorities	7	1
Children affected by HIV/AIDS	7	0
Refugees and internally displaced people (IDPs)	5	1
Children affected by conflict and crisis	5	0
Working children	5	0
Religious minorities	4	0
Boys	3	0
Low-demand populations (e.g. pastoralists)*	3	0
Street children	2	0

Notes: The methodology also contained a category for "other". This category included children from urban slums, as well as overage children and out-of-school children broadly. In no case was an "other" group identified as being the most marginalised.
* "Low-demand populations" refers to groups who view the formal education system as failing to teach the kinds of skills they view as necessary/useful to their livelihoods (i.e. formal education is not seen as highly relevant to, or compatible with, their lifestyles).
Source: GPE analysis based on review of 19 education plans.

A key question, then, is how effective these strategies are. Ideally, a strategy should clearly specify a long-term goal, medium-term objectives and targets. A strategy should be based on verifiable evidence (typically collected from an education sector analysis), and should be presented in parallel with a clear monitoring and evaluation

framework, including considerations of resource allocation, and roles and responsibilities. The strategy's efficacy is assessed along five key dimensions, namely whether it is:

1. Evidence-based: including identification of the underlying causes of the challenge;
2. Relevant: addressing the underlying causes of the challenge;
3. Coherent: aligning the action plan to the strategies;
4. Measurable: through the inclusion of indicators with targets; and
5. Implementable: identifying cost, funding source, responsible entity and timeframes for operationalisation.

A significant limitation of the GPE methodology stems from its review being desk-based. This means that the Results Framework indicator on the proportion of education plans that include a robust equity strategy cannot capture levels of national ownership of, and political buy-in to, the identified equity strategies. Yet these elements are crucial to effective implementation and should, in theory, be considered in parallel to a full assessment of the quality of the strategy. However, evaluating the political credibility of any planning document would require complementary, more qualitative methodological approaches, which are beyond the scope of the GPE indicator.

Results from the analysis of baseline data are presented in **Figure 4.4**. It is encouraging that all 19 plans included at least some reference to strategies for addressing equity issues, thus highlighting the importance accorded to tackling disparities in sector planning processes. In addition, performance overall is strong, with almost three-quarters of plans meeting at least four of the five dimensions. A clear focus on implementation is apparent, with only one plan failing to define how the strategy for marginalised populations would be operationalised. In five cases, measurability was assessed as poor; the extent to which this reflects the difficulty of tracking data for marginalised groups vs. a more general issue of poor capacity to develop robust monitoring frameworks warrants further investigation.

Figure 4.4 Performance of 19 education plans against GPE quality standards
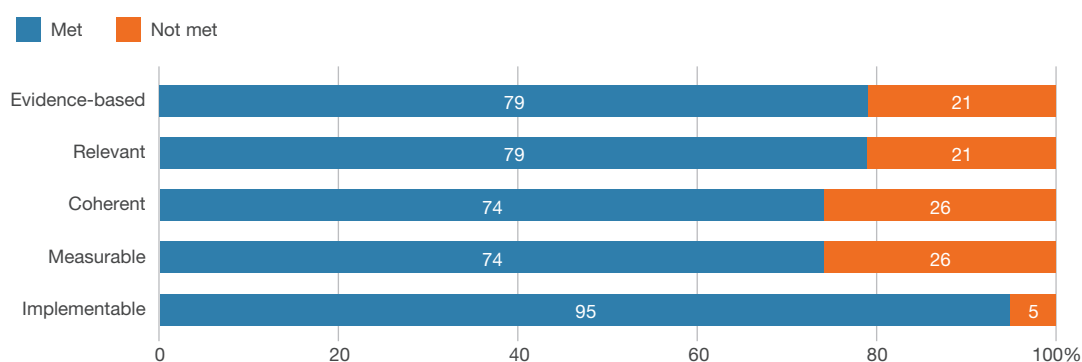
Source: GPE analysis based on review of 19 education plans.

The rating was conducted on a graduated scale, with a dimension considered as being "met" when the plan reflected a reasonable effort to elaborate the core elements of that dimension. Three of the 19 plans scored the maximum possible on all five dimensions of the assessment (i.e. the plan articulated all elements of all dimensions): those for the Central African Republic (refugees and internally-displaced people (IDPs)), Guinea and Togo (both children in remote/rural areas). It is encouraging that the former two are transitional education plans, underscoring that in situations of crisis and fragility marginalised populations remain a key sector priority.

Source: Analysis prepared by the Global Partnership for Education.

(TIMSS) as the basis for their data for tracking progress. Yemen also refers to the Arab Knowledge Report Test. Yemen tracks literacy in lower primary education and mathematics and science in 6th grade. None of the plans reviewed in the region measures equity in learning.

Of the nine plans analysed in Central and Southern Asia, only Nepal, the Sindh Province in Pakistan, and Uzbekistan track learning at the end of primary school.[67] Whereas for Nepal and the Sindh Province in Pakistan literacy and numeracy are assessed in 5th and 6th grades respectively, Uzbekistan defines and assesses education standards at the end of general secondary education (Grades 5 to 9). Again, none of the countries includes a measure for equity in learning.

Regarding the five countries in Eastern and South-Eastern Asia (Cambodia, Malaysia, Mongolia, Myanmar and Timor-Leste) for which information is available, only Malaysia includes learning indicators. Malaysia's 2013 education plan has indicators for learning in both primary and secondary education.[68]

In summary, there is a lack of attention to equity in learning across all national education plans. Of the 24 national education plans reviewed for countries which are classified as low income, 9 include learning indicators in early grades of primary education. Only 3 of them include equity dimensions in their indicators: Ethiopia, Mali and Somalia, and equity is only focused on sex. Of the 34 national education plans for lower-middle-income countries, only 11 include learning indicators and only Cameroon and Zambia disaggregate by equity dimensions. Even among the education plans for the 11 countries classified as upper-middle income, only Mexico and Samoa track learning according to equity in primary education.

4.2 DATA NEEDS FOR MEASURING EQUITY[69]

The preceding analysis of national education plans and the overview of data availability in Section 3.4 make clear that much can be done to improve education indicators on equity, and especially to ensure that the most disadvantaged children are represented. A more expansive approach to how disadvantage is measured is recommended, which would include expanding the coverage of data collection and more explicit analysis of disadvantaged groups from the earliest years.

4.2.1 A more expansive approach to how disadvantage is measured

Collecting data on a broader range of dimensions of inequity

Where country education plans do disaggregate indicators, the focus is most frequently on sex. While girls have fewer educational opportunities than boys in many contexts globally (Rose, Sabates, Ilie and Alcott, 2016), which makes sex an important dimension to track, it is just one element of potential inequality. For education plans to better tackle disadvantage, data must be collected on a far broader range of characteristics: children's socioeconomic, disability, geographic, racial, ethnic and linguistic characteristics, in addition to sex. These are all dimensions for which data are, or could be, collected in most settings.

In many contexts, the most important dimension of inequity is socioeconomic status. Although average wealth levels vary greatly across countries, inequities between the poorer and richer within countries are near-ubiquitous (UNESCO, 2014). Cross-sectional data from East Africa and South Asia show that the

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67 Other provinces of Pakistan were not included in the present analysis.
68 Ministry of Education, Malaysia (2013). Education Blue Print 2013-2025 (pp. E12 and E25).
69 Parts of this section draw on Rose, Sabates, Alcott and Ilie, 2016.

learning of children from less economically-advantaged households is at least one year behind that of children of the same age from more economically-advantaged households (Alcott and Rose, 2016; Jones and Schipper, 2012). In South Africa, by Grade 3 the poorest 60% are three grade levels behind the wealthiest quintile (Spaull and Kotze, 2015).

Measuring socioeconomic status is not straightforward but is possible. Some relatively simple approaches have been developed, which are compatible with more complex measures of income and expenditure. One such measure is the wealth index, which requires recording the ownership of a set of household goods, housing characteristics and access to household services in order to compute the relative wealth position of each household within the country. Wealth indices using DHS data have been found to perform as well as expenditure data in explaining variation in educational outcomes and are as useful as other relevant indicators of child health and well-being (Filmer and Pritchett, 1999; Filmer and Scott, 2012). There have also been subsequent improvements in the computation of wealth indices to make them comparable across countries and over time (Smits and Steendijk, 2015).

Another measure of socioeconomic status that requires a relatively small number of items to compute is the poverty score (Schreiner, 2010). The idea behind the poverty score is to create a "scorecard" of objective poverty indicators that are strong determinants of income poverty in the given context. A typical poverty score card includes information from household and housing characteristics (e.g. cooking fuel, type of floor), background of the household head (e.g. single parent, highest level of education), access to household services (e.g. electricity, water) and durable goods (e.g. mobile phone, assets). A poverty score requires information from consumption and expenditure surveys which are available in many countries that make it possible to compute the income poverty line and identify the most relevant items in the given context. Once this is established,

information for a simple poverty card can then be collected at scale.

A potential limitation with the wealth index and poverty scorecard though is their inability to capture changes in the predictive power of specific items on income poverty over time. For example, the lack of a mobile phone is now a strong predictor of poverty in many sub-Saharan African countries, but this was not the case a decade ago.

Overall, the key message is that with a small number of simple, easy to collect items for a given measure, which are usually also available in household surveys, education authorities can enrich their information on students and link this information to educational access, progress and completion. Advances have also been made to link children's background information to learning, for example using data from the Young Lives international research project or citizen-led assessments from the People's Action for Learning (PAL) Network *(see Section 4.2.2).* In addition, most household surveys contain information that enables the computation of wealth indices and poverty scores described above.

Another key potential dimension of inequity is regional and geographic disparities within a given country. Taking rural India as an example, there are large cross-state disparities in the proportion of 10- to 13-year-olds who are in school and learning (i.e. able to perform division) at all wealth levels. Among households from the poorest quartile with equivalent levels of deprivation, the proportion of 10- to 13-year-olds who are in school and learning ranges from 7% in Gujarat to 33% in Tamil Nadu; among households from the wealthiest quartile, the same proportion ranges from 30% in Maharashtra to 76% in Manipur *(see* **Figure 4.5***).* Similarly, in South Africa, children from the wealthiest provinces are six times as likely to have basic mathematics skills as children from its poorest provinces (Moloi and Chetty, 2010). Another clear divide is between urban and rural environments. In Ethiopia, urban 8-year-olds are more than five times as

likely as rural 8-year-olds to be able to read sentences (Rolleston et al., 2014). Urban/rural inequalities are also apparent in El Salvador, Guatemala, India, Pakistan, Panama, Peru, Tanzania, Viet Nam and Zambia (Altinok, 2013; Burger, 2011; Rolleston et al., 2014; Tayyaba, 2012; UNESCO, 2014).
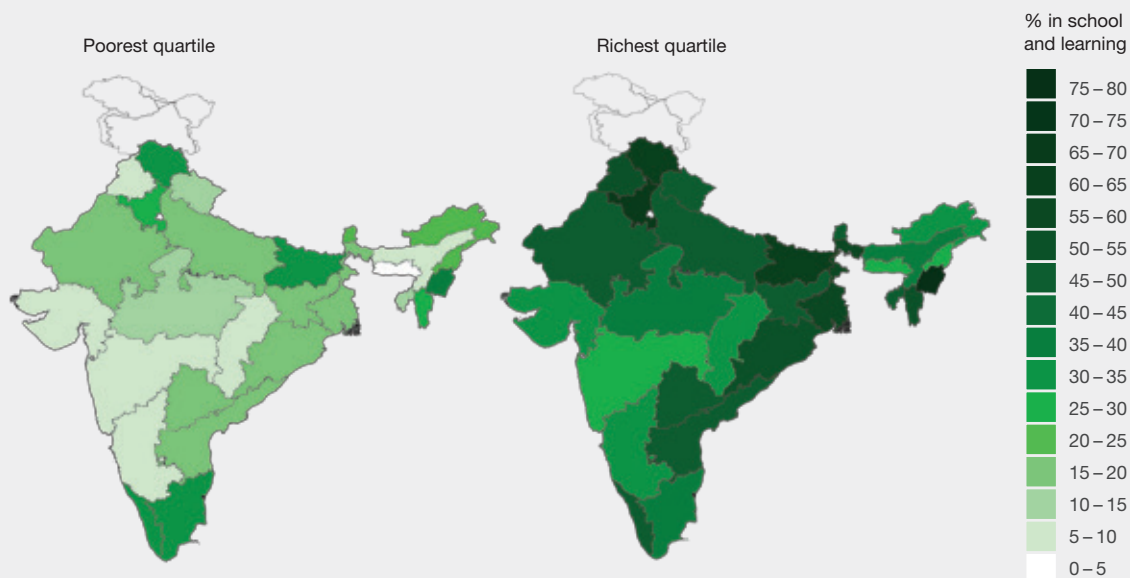
Collecting data on regional location is often straightforward. Most education management information systems (EMIS) datasets have information both about school resources and their geographic location. This complementarity makes it possible to have refined information about clusters of indicators, for example on the different educational backgrounds of teachers by sub-region. With national data, such as national examinations, it is also possible to obtain the location where students took their examination, which will often be a good proxy for the location where they reside. This information enables analysis of regional gaps in learning. Household surveys also

collect information at the regional level, although disaggregation of indicators at sub-regional levels is not always possible. For example, DHS surveys are representative of the country and of the main regions of the country but cannot always be representative of more refined geopolitical divisions within countries. It is also possible to collect representative indicators that distinguish rural, semi-urban and urban areas, although identifying boundaries between rural and urban settings can be a significant challenge, in particular in contexts with large peri-urban populations and with rapid urbanisation.

Ethnic, racial and linguistic groupings frequently provide a further source of inequity. Children whose household language is different from their language of instruction learn less in a range of countries, including Benin, Cameroon, Guatemala, the Islamic Republic of Iran and Turkey (Altinok, 2009; Fehrler and Michaelowa, 2009). In Peru, the average

Figure 4.5 Educational opportunities vary greatly across rural India

Percentage of children in India aged 10-13 years who are in school and learning, by state and wealth, 2014

Poorest quartile   Richest quartile

% in school and learning

75 – 80
70 – 75
65 – 70
60 – 65
55 – 60
50 – 55
45 – 50
40 – 45
35 – 40
30 – 35
25 – 30
20 – 25
15 – 20
10 – 15
5 – 10
0 – 5

Notes: The maps displayed in the charts are for reference only. The boundaries, colors, denominations and any other information shown on these maps do not imply, on the part of the UIS, any judgment on the legal status of any territory, nor endorsement or acceptance of such boundaries. Data not shown for contested areas of Jammu and Kashmir, Shaksam Valley, and Aksai Chin. Sample covers 10- to 13-year-olds in the highest and lowest wealth quartiles. 'In school and learning' refers to the child being in school and able to perform division. *Source: Rose et al. (2016), drawing on data from ASER 2014.*

primary school child whose mother tongue is Spanish outperforms 84% of children speaking an indigenous language in mathematics (Cueto et al., 2014). Collecting data on differences between these groupings (a form of horizontal inequality) is possible, but in some contexts can be politically charged. For example, it is not considered appropriate in post-genocide Rwanda, where Tutsis, Hutus and Batwas are not identified by ethnicity in learning assessments or national surveys. Nevertheless, Rwandans living in extreme poverty are sometimes identified as being "historically marginalised", although not all national surveys single out the population in this way.

Until recently, children with disabilities have been invisible in, and sometimes even excluded from, most data sets, largely due to challenges in identifying them and concerns about stigmatisation through doing so. While cultural and linguistic variations in understanding, defining and responding to disability have made this element of equity particularly difficult to measure at scale, important progress has now been made on how to remedy this. Rather than asking the very direct question in surveys, "Do you have a disabled member in your family?", international initiatives have begun to rephrase the question and to ask instead about the difficulties that children face (relative to other children of the same age).

The approach by the Washington Group on Disability Statistics towards identifying functional limitations is based on the UN Convention on the Rights of Persons with Disabilities, which defines disability as including "those who have long-term physical, mental, intellectual or sensory impairments which in interaction with various barriers may hinder their full and effective participation in society on an equal basis with others" (United Nations, 2007). Over the years, the Washington Group has developed sets of questions aimed at different population age groups. This includes a set of "Child Functioning Questions" for children aged 5 to 17 years. To focus the respondent on the functioning of their own child with reference to that child's cohort, where

appropriate, questions are prefaced with the clause "Compared with children of the same age…" Overall, experience with using the questions developed by the Washington Group indicates that they provide a simple, sensitive and nuanced way of capturing disability, even in contexts where there are concerns that stigma could prevent direct reporting of disability. The questions provide the opportunity for international comparability and have been developed using a rigorous methodology.

An example of the use of disability identifiers in a household survey comes from the Annual Status of Education Report (ASER) Pakistan which, since 2015, has used the short set of questions developed by the Washington Group with adaptions from the longer set of child functioning questions. From these data, it was possible to determine that children with disabilities are likely to be among the most disadvantaged in education. Based on ASER Pakistan data in Punjab, Pakistan, only 71% of 5- to 16-year-olds with moderate to severe difficulties were attending school, compared with the average school attendance rate of 83% for children of the same age who were not reported as having any difficulties. There is an even starker gap, though, in rates of learning: just 11% of children with moderate to severe difficulties could do subtraction, compared to 53% of children with no difficulties. Type of disability matters too: children with moderate to severe physical difficulties were twice as likely to be out of school as children with moderate to severe learning difficulties. However, none of the children with moderate to severe learning difficulties were able to do subtraction, in contrast to 15% of children with moderate to severe physical difficulties (Rose, Sabates, Alcott and Ilie, 2016).

There have been significant advances in recent times towards identifying children with disabilities in surveys in ways that allow their access to education and learning to be compared with that of other children from similar backgrounds. This has been helpful in developing new ways to provide appropriate support and resources. However, other groups remain

invisible. For example, nomadic and migratory groups continue to be hard to reach and are near absent even in population censuses (Carr-Hill, 2017). Slum populations are also hard to reach by enumerators working for national statistical agencies due to problems of security and violence, although other, citizen-led surveys have had some success reaching these populations (Carr-Hill, 2017).

At the international level, several initiatives have been launched to improve the measurement of equity in learning. International comparability of equity measures is particularly important in the SDG 4 monitoring framework, which also means that agreement on common definitions, metrics and standards is necessary. **Box 4.2** describes activities by the UIS and other international organizations in this area.

Box 4.2 International initiatives in support of equity measurement

The UIS, the statistical agency responsible for compiling and disseminating internationally-comparable data in UNESCO's fields of competence, plays a critical role in the Education 2030 Agenda. This mandate is set out in the Education 2030 Framework for Action, which ratifies that the UIS is the official source of cross-nationally-comparable data on education for SDG 4 (UNESCO, 2016b). A particularly critical aspect for reporting on progress towards SDG 4 is the measurement of equity across all data sources for education indicators. In support of this goal, the UIS has convened expert groups to work on indicator development, published methodological guidelines and expanded its international database with education indicators to improve coverage across countries, years and dimensions of disaggregation.

In 2016, the UIS convened the Technical Cooperation Group on the Indicators for SDG 4–Education 2030 (TCG) (http://tcg.uis.unesco.org) as a platform to discuss and develop the indicators used to monitor SDG 4 in an open, inclusive and transparent manner. The TCG works in tandem with the Global Alliance to Monitor Learning (GAML) (http://gaml.uis.unesco.org) to make recommendations on indicator development. GAML takes the lead in the development of indicators related to learning and skills assessment, while the TCG focuses on issues related to the other indicators. The UIS also leads two other expert groups: the Inter-Agency Group on Education Inequality Indicators (IAG-EII) (http://iag.uis.unesco.org) and one Task Force of the Intersecretariat Working Group on Household Surveys (ISWGHS) (https://unstats.un.org/iswghs/).

Household surveys are the main source of disaggregated education data for the analysis of disparities between different population groups. The IAG-EII, created by the UIS, UNICEF and the World Bank in 2016, aims to promote and coordinate the use of household survey data for SDG 4 monitoring at the national, regional and global levels. The IAG makes recommendations to harmonise the processing of survey data by different agencies and collaborates on standardised definitions of survey-based indicators and of individual and household characteristics for data disaggregation.

In the ISWGHS, the UIS leads the Task Force on Standards for Education Spending Estimates based on Household Survey Data, which focuses on methodological development of SDG Indicator 4.5.4 (education expenditure per student by level of education and source of funding). The Task Force has produced a document mapping sources of information on education spending by households (UIS, 2017) and is also drafting a *Guidebook on Education Expenditure in Household Surveys* that will be published in 2018.

In addition to these examples of methodological work, the UIS continues to improve the availability of data for monitoring of progress towards SDG 4. Recent activities include the launch of pages dedicated to SDG 4 and equity in the UIS website (http://uis.unesco.org), addition of more disaggregated education indicators in the UIS. Stat online database (http://data.uis.unesco.org) and the dissemination of interactive maps and charts that allow users to explore data related to SDG 4.

Source: Prepared by the UNESCO Institute for Statistics.

The intersecting nature of disadvantage

Sources of inequity frequently compound one another. It is therefore crucial to view child characteristics in conjunction with each other rather than in isolation. Taking sex and socioeconomic status as a starting point, it is most often poor girls who are least likely to be learning the basics when these factors interact. In rural India, gender disparities are considerable between poorer girls and boys at the primary level, while wealthier girls keep up with or exceed learning among wealthier boys (Alcott and Rose, 2017).

Across South Asia and East Africa, there are sizeable gaps between poorer and wealthier children in enrolment and learning (Rose, Sabates, Alcott, and Ilie, 2016). In Kenya, Tanzania and Uganda, and in rural areas of India and Pakistan, there is at least a 20-percentage-point gap between rich and poor in the share of children aged 10 to 13 years who are in school and have learned basic mathemathics skills *(see **Figure 4.6**)*. These gaps are considerable in and of themselves.

Figure 4.6 Socioeconomic inequities are exacerbated by other disadvantages

Percentage point gap in ability to perform division between more- and less-advantaged groups, showing cumulative impact of additional dimensions of disadvantage

Gap in % in school and able to perform division (percentage points)

Notes:
1. Sample covers 10- to 13-year-olds.
2. 'Poverty' differentiates between the highest and lowest wealth quartiles. 'Mother's education' differentiates between those whose mothers attended school and those whose mothers did not. 'Region' differentiates between locations depending on the country: state (India), province (Pakistan), region (Tanzania), county (Kenya) and sub-region (Uganda).
3. Figure 4.6 uses logistic regression models with interaction terms that progressively added more intersections of inequality. The bars build upon one other to show the increase in inequality as one moves from more general subgroup comparisons, such as between poor and rich, to more specific comparisons, such as between girls from low wealth quartiles and boys from high wealth quartiles. For each country, the first bar (blue) shows the gap between the poorest and richest quartiles, and the second bar (orange) alone shows the additional inequality between poor girls and rich boys. The total size of the poor girl-rich boy gap is the two bars added together. For a given country, when one adds all four bars together this shows the gap between (1) boys from the highest wealth quartile in the best-performing region whose mothers attended school, and (2) girls from the lowest wealth quartile in the worst-performing region whose mothers did not attend school.
Source: Rose et. al. (2016), based on the 2014 ASER and UWEZO surveys.

Yet, when taking account of multiple dimensions of disadvantage, inequalities grow further still. In rural India, rural Pakistan and Uganda, wealth gaps are compounded by gender disparities. In rural Pakistan, for example, the gap between poorer and wealthier children increases by one-third, from 19 to 25 points, when comparing poorer girls to wealthier boys. And while the occurrence of gender disparities varies by country, first-generation school-goers are at a disadvantage in all countries. When focusing not only on poor girls but on those whose mother never attended school, the gap between these children and wealthier boys whose mother did attend school increases learning inequalities in each country by at least 8 points. In Kenya, this combination of factors almost doubles the gap, from 24 to 42 points *(see Figure 4.6).* Within each country, regional disparities further exacerbate inequality, most starkly in rural India, rural Pakistan and Tanzania. In Tanzania, regional disparities double the inequality in rates of children in school and learning: the gap between wealthier boys whose mothers went to school and poorer girls whose mothers did not stands at 29 points, but this gap increases to 57 points when comparing advantaged boys in the best performing region to disadvantaged girls in the worst performing region.

The inter-sectional nature of disadvantage cannot be overlooked if policies are to support those most likely to be left behind. To improve the accuracy, relevance and efficacy of policy and planning, it is essential to collect data and track progress on multiple forms of disadvantage. This would necessarily include gender, but would also go well beyond it in order to assess how the interaction of gender with other key sources of disadvantage holds children back. As indicated in Chapter 3, this is an issue of sampling and design, as well as of the type of data collected.

4.2.2 Expanding the coverage of data collection

Data should focus on, and account for, a broader range of disadvantages. What then are the additional implications for the process of collecting these data?

### *Learning assessments must reach those out of school*

It is insufficient to assess learning of school-attending children alone. Measuring progress towards education targets means also gathering data on and including the most disadvantaged children, who are frequently not in school. Among 67 low- and middle-income countries with data, very few have achieved equality in primary school completion between the rich and poor *(see Figure 4.7*) and across these countries, the average gap between the richest and the poorest is 32 percentage points. As such, using data on school-going children alone to track progress on learning would disproportionately represent the relatively well off, thus bias an understanding of conditions for the most disadvantaged.

In addition, it is not sufficient simply to presume that the disadvantaged children who are in school are representative of disadvantaged children out of school. For example, among the poorest girls in rural Pakistan who are in school, only around one-half of these children have learned basic mathematics skills by age 12 *(see Figure 4.8).* While this in itself is alarming, among all poor girls who are out of school at age 12, less than 5 in 100 have gained these skills.

Complementary sources of data are therefore needed. Data sampling representative of all children might thus be better achieved by adopting a sample-based household survey of the kind used in PAL Network citizen-led assessment surveys, DHS and other household surveys, which also have the benefits of enabling the collection of data related to the background characteristics of the children and their households. PAL Network surveys, for

Figure 4.7 In almost every country, poorer children are far less likely than richer children to complete primary school, latest year available (2006-2014)

Percentage of poorest and richest quintiles who complete primary schooling
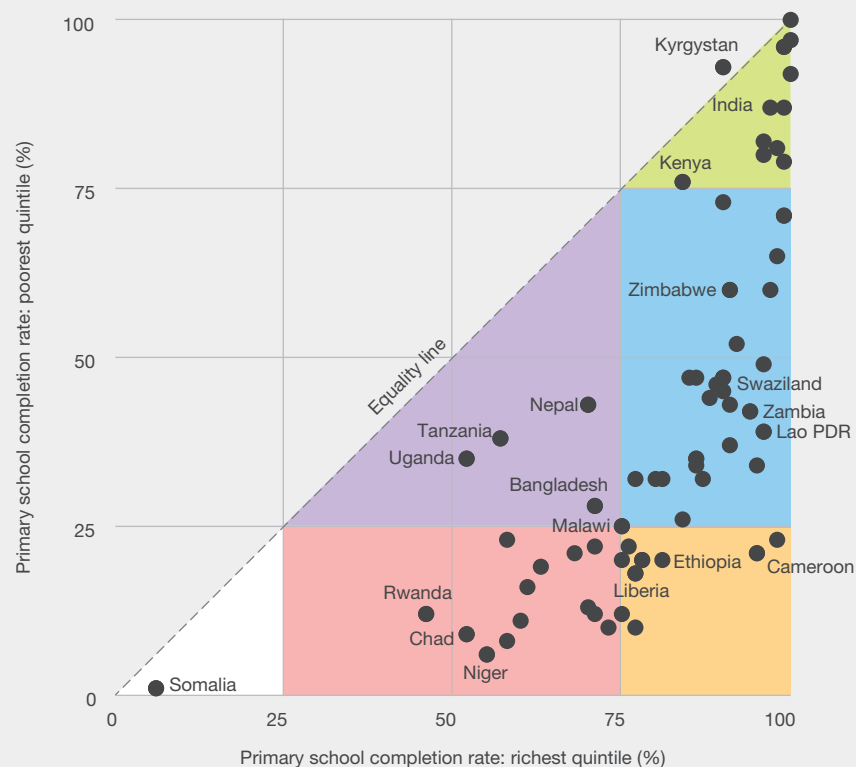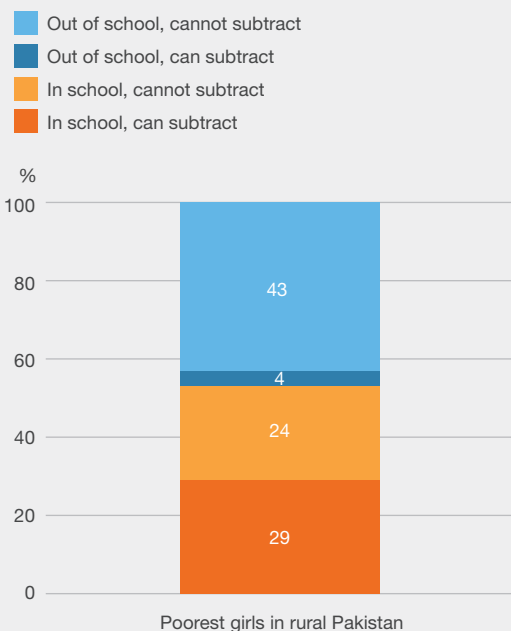

Notes:
Group 1 (green, 13 countries): High completion rates (over 75%) for both richest and poorest: Armenia, Bolivia, Egypt, Georgia, Guyana, India, Indonesia, Kenya, Kyrgyzstan, Republic of Moldova, Tajikistan, Ukraine, Viet Nam.
Group 2 (blue, 26 countries): High completion rates (over 75%) for richest and moderate completion rates (25% to 75%) for the poorest: Benin, Bhutan, Cambodia, Comoros, Congo, Democratic Republic of the Congo, Djibouti, Gambia, Ghana, Guatemala, Honduras, Lao People's Democratic Republic, Lesotho, Morocco, Nicaragua, Philippines, Sao Tome and Principe, Sierra Leone, Sudan, Swaziland, Timor-Leste, Togo, Uzbekistan, Zambia, Zimbabwe.
Group 3 (orange, 10 countries): High completion rates (over 75%) for richest and very low completion rates (below 25%) for the poorest: Cameroon, Ethiopia, Guinea, Haiti, Liberia, Madagascar, Malawi, Mauritania, Nigeria, South Sudan.
Group 4 (purple, 4 countries): Moderate completion rates (25% to 75%) for both richest and poorest: Bangladesh, Nepal, Tanzania, Uganda.
Group 5 (red, 13 countries): Moderate completion rates (25% to 75%) for the richest and very low completion rates (below 25%) for the poorest: Afghanistan, Burkina Faso, Burundi, Central African Republic, Chad, Côte d'Ivoire, Guinea-Bissau, Mali, Mozambique, Niger, Rwanda, Senegal, Yemen.
Group 6 (white, one country): Very low completion rates (below 25%) for both the richest and poorest: Somalia.
Source: Rose, Sabates, Alcott and Ilie (2016), using WIDE database, DHS, MICS, ASER, and Uwezo data.

example, randomly select villages and households within districts, and provide survey weights to account for the different sizes of different districts. The robust nature of this sampling approach provides nationally representative data without a need to visit all households, as in a census. For more information on the design of household survey samples, refer to Section 3.5.

Including learning assessments as part of household surveys is key to making sure that out-of-school children are included for tracking progress in learning. This also offers the additional benefit of avoiding unintended consequences of school-based assessments, such as schools putting forward their most able children and "teaching to the test". Such assessments have to be well designed to capture

Figure 4.8 Among poor girls in rural Pakistan, those out of school are far less likely to be learning

Percentage of poorest quartile of girls in rural Pakistan who can and cannot subtract, by schooling status, 2014

- Out of school, cannot subtract
- Out of school, can subtract
- In school, cannot subtract
- In school, can subtract

%

100	
80	43
60	
	4
40	24
20	
	29
0	

Poorest girls in rural Pakistan

Note: Sample covers 10- to 13-year-old girls in rural areas who are in the lowest wealth quartile.
Source: ASER Pakistan 2014.

children's skills and competencies. To aid analysis, they should be comparable over time and of broad enough scope to capture variation across different ages. Assessments should also avoid strong floor and ceiling effects, defined by the inability of children to respond to any question in the examination or for most children to respond to all questions correctly. This is a common pitfall with national examinations in developing countries based on the competencies of the national curricula, which are frequently unrealistically difficult for children (Pritchett and Beatty, 2015), thus creating floor effects preventing any meaningful analysis of the stage most children are at in their learning.

Another shortcoming of high-stakes national examinations is that there is no comparability over

time, as examinations are used to select students to pass to the next level, and so they are standardised differently every year. Changes in content and various features of the questions alter the likelihood of children answering correctly. The scores obtained by "equivalent" children in different years will therefore vary (Goldstein, 1983; Newton, 1997). Since it cannot be assumed that national examinations are comparable over time, standardisation is possible by setting cut scores for each level which reflect the equivalent achievement of the previous year (or the previous time when the national examination took place).

While household-based learning assessments improve upon school assessments in their coverage of the most disadvantaged groups, there are still important gaps. The most pressing is how to reach children not living in formal households, such as children in nomadic communities, institutions, unrecognised urban settlements, or those displaced by conflict. When data are collected by local citizens, their contextual knowledge may make such surveys particularly apt for gathering data for such children (Carr-Hill, 2017). Still, ongoing sensitivity and consideration should always be given to how data can more comprehensively represent such children.

Choices need to be made with respect to whether assessments should measure learning the basics or the competencies of a specific curriculum. Whichever choice is made, it is crucial that every effort be made to reach the most marginalised and record children's key background characteristics. Household surveys offer a good way to collect information about children that cannot easily be gathered at the school level (such as socioeconomic status) and would also include children who are not in school.

Ideally, school and household data should be linked, so as to highlight the effects of class size, facilities, teacher preparation and teaching practices on the most disadvantaged children. This could be done using administrative data already collected

on schools, such as EMIS data. The Young Lives international research project and APRESt (Muralidharan and Zieleniak, 2013) offer two current examples of how school and household data have been linked in low- and lower-middle income countries.[70] Data from Young Lives, for example, have been used to show the links between schooling opportunities and learning outcomes between more and less advantaged children (Singh, 2014).

4.2.3 Focusing explicitly on disadvantaged sub-groups from the earliest years

The key principles then in collecting data are to ensure identification of the most disadvantaged groups to ensure that coverage includes all children (including those not in school) and to complement these data with information on the educational opportunities available to each child. But how to make best use of such data?

Set "stepping stone" interim targets to track progress before it is too late

The Education 2030 Framework for Action accompanying the SDGs acknowledges that "no education target should be considered met unless it is met by all" (UNESCO, 2016b) and so it is crucial that data analysis disaggregates and focuses on the most disadvantaged. It is therefore key to maintain a similar focus on indicators and, by extension, policy responses. For example, in order to identify the progress needed by 2030, Watkins' (2015) proposal of "stepping stone" targets, which set interim targets adjusted to specific countries, offers a clear means to account for the different rates of progress needed for different sub-groups within countries *(see Figure 4.9)*. In addition, the use of stepping stone targets with shorter intervals (e.g. every five years) is more informative for the reality of national planning imperatives, which tend to relate to political electoral

Figure 4.9 Ensuring all 12-year-olds are learning the basics by 2030 will require efforts targeted at the most disadvantaged

Projected change for all children to be learning by 2030, by wealth quintile
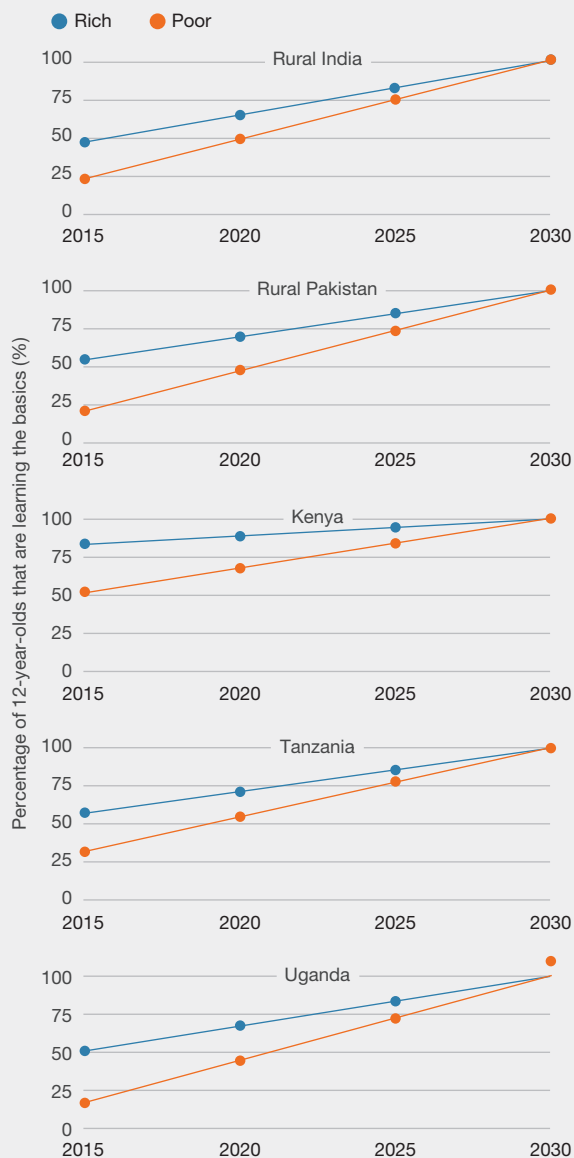
Notes: These projections are based on ASER India 2012, ASER Pakistan 2012, and Uwezo 2012. 'Rich' and 'Poor' refer to the richest and poorest quintile of households in each country, respectively. *Source: Rose and Alcott (2015).*

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70 The Andhra Pradesh Randomized Evaluation Studies (APRESt) hold data from a range of policy evaluations. These data are not currently publicly available.

Handbook on Measuring Equity in Education

cycles; such targets also make it possible to see whether sufficient progress is being made for the most disadvantaged groups well before the more distant deadline year (Rose, 2015).

Track progress in the early years

In order to be able to track progress towards learning goals for all children, it is essential that data analysis actively inform practice, rather than simply describe the state of affairs once it is too late. Rather than school-leaving data (or, in some countries, secondary school entrance exam information), a greater emphasis should be put on learning assessments at earlier ages. This is when inequities begin and after which they become entrenched: in all four of the Young Lives countries – Ethiopia, India (Andhra Pradesh), Peru and Viet Nam – the richest quartile makes more progress than the poorest quartile in mathematics between ages 5 and 8 (Rolleston et al., 2014).[71] Identifying those most in need is critical to maintaining their progress: data from a range of learning assessments in India indicate that only between 9% and 13% of those who lack basic literacy or numeracy skills are able to gain this skill even after an additional year of schooling (Bhattacharjea et al., 2011; Educational Initiatives, 2010; Pritchett and Beatty, 2015).

In short, those facing the greatest educational inequities live in households affected by poverty, with disadvantage reinforced by where children live, their gender and whether they have a disability. They are also likely to be children not living in formal households and who are therefore usually excluded from data collected with household surveys. Such factors should not determine a child's learning potential. Given uneven progress through primary schooling, and that this progress is often linked to sources of inequality associated with inherited disadvantage, there is a need to track progress in learning from the earliest years. In order to better measure progress towards more equitable education systems, data must identify multiple sources of disadvantage, ensure coverage of the most marginalised populations and be put to use in time to not only describe the opportunities afforded these children but also to influence the design of policies aimed at achieving equity in education.

4.3 CONCLUSION

Ensuring no one is left behind in educational access and learning is a major priority in SDG 4. As many countries do not have regular standardised national assessments, it is difficult to establish comparisons both within and between countries. The SDGs certainly highlight the urgent need to develop assessments that can be used to compare progress towards basic literacy and numeracy. But even if they are developed, they might not be the most appropriate way to track learning from an equity perspective: notably, children who are out of school are likely to be among the most disadvantaged and remain invisible in these assessments. In addition, public examination results do not always provide comparable data in a form needed to track progress over time, nor do they enable disaggregation by core dimensions of inequality, such as socioeconomic status.

Currently, national education plans might implicitly measure equity by ensuring minimum standards (as defined in Chapter 2) are reached, i.e. that all children in principle, regardless of their backgrounds, need to achieve the same level in learning. However, unless progress is tracked for different sub-groups, it is unlikely that disadvantaged groups can improve at the faster pace they need to close learning gaps with the rest of the population.

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71 Related analysis finds that the gap in achievement between these four countries remains stable as children get older, with children in Viet Nam performing best, followed by Peru, India and then Ethiopia. The gap remains wide, even once socioeconomic status and other factors are taken into account (Singh, 2014).

It is necessary to measure equity in learning at all education levels and for the whole school-age population (whether in school or not), starting from early grades. The use of more appropriate indicators to track equity in access and learning, such as those related to impartiality by disaggregating for sub-groups of the population as described in Chapters 2 and 3, will allow us to ensure that not only minimum standards are met but also that equity gaps in education are narrowed.

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