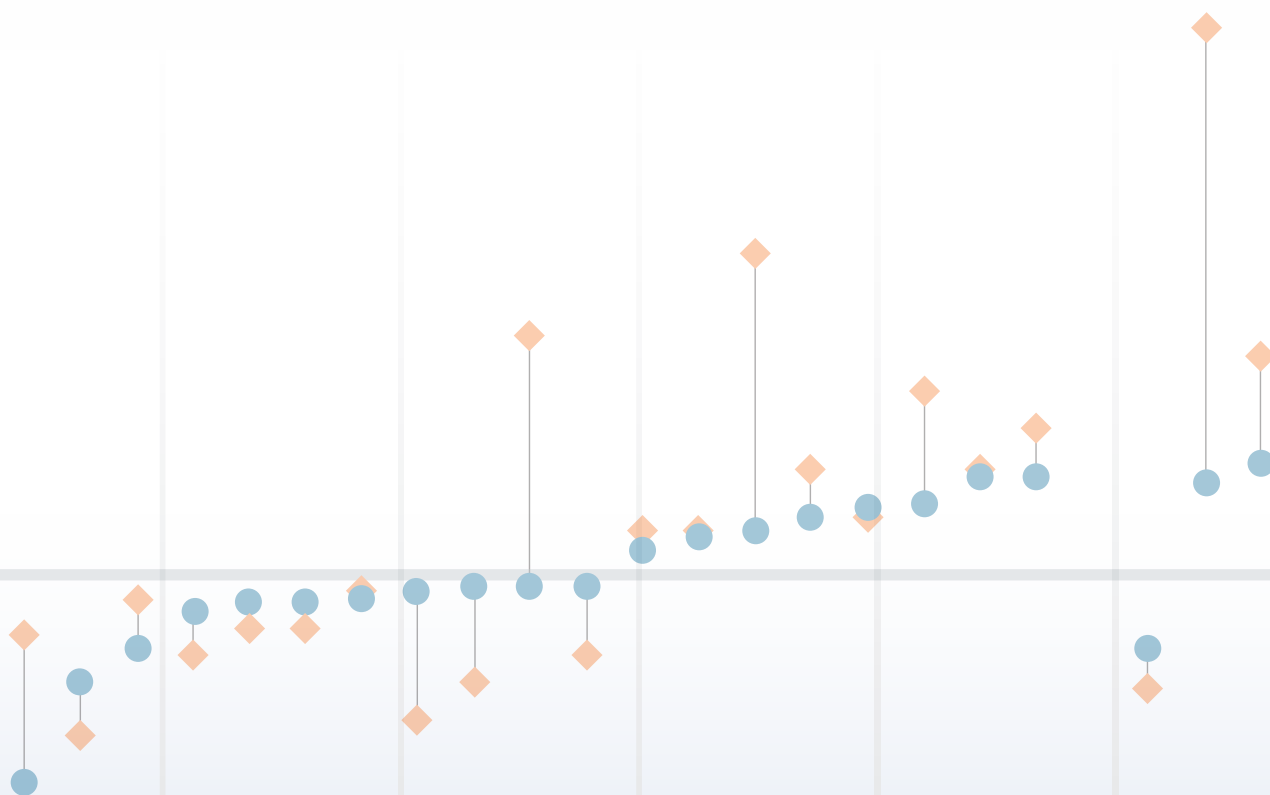


# OUT OF SCHOOL CHILDREN

Data Challenges In Measuring Access to Education



JUNE 2013

This report was written by Carina Omoeva, Benjamin Sylla, Rachel Hatch, and Charles Gale, of the FHI 360 Education Policy and Data Center (EPDC). EPDC is a data and research unit within the Global Learning Group of FHI 360. The authors are indebted to colleagues Ania Chaluda, Anne Smiley, John Gillies, Kurt Moses, Mark Ginsburg, and David Sprague, for their review and comments on earlier drafts of this report. The authors are also grateful to Albert Motivans and Friedrich Huebler of UNESCO Institute for Statistics (UIS) for their comments on an earlier draft of this report, as well as insights into forthcoming UIS publications.

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## Data Challenges In Measuring Access to Education

EDUCATION POLICY AND DATA CENTER | FHI 360

Carina Omoeva, Benjamin Sylla, Rachel Hatch and Charles Gale

## NOTE TO THE READERS

*As a testament to the fluctuation in measurement of out of school children and the fluid context in which it is carried out, a number of changes have taken place days before this report was ready for publication. The current estimates of out of school children of primary age issued by the UNESCO Institute for Statistics (UIS) have been revised, with the 2000 estimate now running at 102 million, and the 2010 figure, previously estimated at 61 million, now revised to 59 million children. The latest published figure for primary aged children out of school, dated 2011, is 57 million. At the lower secondary level, the figure was placed at 69 million in 2011. The issues and challenges pointed out by the report, however, remain current, and we invite the reader to engage with us in understanding the complexities of measurement that define so much of the global conversation on out of school children.*

—EPDC

## FOREWORD

In the year 2000, the international community established a set of ambitious Millennium Development Goals to address the most critical challenges to human development by 2015. An important element in setting and meeting such global challenges is to be able to accurately measure the status and the progress towards meeting the goal. The measurement challenge has two important factors: first, to understand the general scope of the problem, in order to effectively advocate and mobilize global resources to address it; and second, to utilize the data to understand the specific level of the problem in each country, to better frame effective responses and ensure efficient allocation of resources.

Nowhere is this challenge greater than in measuring Goal 2: Universal primary education. As we approach the milestone year of 2015, the global education community is focused on actions needed to ensure that all children complete a full cycle of primary education, and donors prepare to increase their investment in reducing the number of out of school children. In the push towards this goal, the community tends to overlook the quality of the data, and move straight to solutions and interventions. Meanwhile, as the Education Policy and Data Center of FHI 360 (EPDC) suggests in this report, data availability and reliability have lagged behind, making the regional and global estimates of out of school children extremely difficult to make – as illustrated by the regular revisions of these numbers issued by international agencies.

Led by the UNESCO Institute for Statistics (UIS), the metrics and methodologies for education data have been refined and improved over the past two decades. Important work takes place around the measurement of school exclusion, under the auspices of the Global Initiative on Out-of-School-Children of UIS and UNICEF. With this report, EPDC seeks to contribute to the process of improving the metrics that inform international and national efforts to address the problem of out of school children. Through a thorough review of the publicly available data, the research team identifies definitions and approaches that are insufficiently consistent across countries, and points to the prevalence of missing data and vast discrepancies across sources, which suggest that the true number of out of school children may be different than the current published figures.

Why does this matter? Improved measurement methods will not change the underlying message that the scale of the problem is large and the implications important for development. However, a more nuanced and exact understanding of what the data means can substantially affect the efficacy and allocation of resource investments. Using two case studies, this paper outlines how these issues affect measurement at the national level and suggests: a) a broader definition of what constitutes education; b) some concrete strategies for filling in “data gaps;” and c) a renewed focus on strengthening national monitoring in line with commitments to EFA made by key countries. I hope that this rigorous analysis will stimulate a needed dialogue about how to measure accurately, and then how to address effectively, the challenge of out of school children.



**John Gillies**

Director, FHI 360 Global Learning Group

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## EXECUTIVE SUMMARY

In the two-plus decades since the World Conference on Education for All in Jomtien, Thailand, there has been remarkable progress in expanding access to education around the world, and particularly in low-income countries. However, primary school access is still far from universal: new policies and programs have allowed the “low-hanging fruit”—the children facing the fewest barriers—to enroll in large numbers. As a result, identifying and removing barriers to school access for the hardest to reach has become a much more complex undertaking.

The international consensus, set by the UNESCO Institute for Statistics (UIS), is that there are approximately 61 million children out of school at the primary level, and 71 million at the lower secondary level (UNESCO, 2012). Global figures such as these are important for advocacy purposes, as well as for gauging the scope of the challenge, but real measurement of change over time—be it on a global or national level—presumes a certain level of data reliability, as well as an ability to distinguish between true progress and random noise. In this report, we show that more needs to be done globally to strengthen the quality, relevance, comparability, and consistency of international data on school participation.

This report builds on efforts by UIS and UNICEF to identify data challenges and establish a streamlined methodology for measuring school exclusion. Measurement challenges include:

- **Lack of reliable and timely data on school exclusion.** A review of available UIS data shows a considerable amount of missing information, particularly for countries where the number of out of school children (OOSC) could potentially be quite high, given their recent history (i.e. Sierra Leone, post-secession Sudan and South Sudan, Haiti). For some countries, such as Bangladesh and the Democratic Republic of the Congo, the

figures factored into the global estimate are not published, and the most recent available UIS figures are more than a decade old (1990-1995). In any given year since 1999, national-level data on the number of out of school children are not available for nearly 40% of the countries listed in the UIS Data Centre, and while UIS estimates were factored into the regional aggregate values to account for the missing countries, the absence of such a large proportion of country-level figures indicates that UIS may have concerns about the reliability of these data points.

- **Limited use of household survey data sources.** At this time, national data on out of school children published in the UIS Data Centre, as well as in UIS e-Atlas on Out-of-School Children do not include data from household surveys. While UIS reports using a variety of methods and sources, including references to surveys, to impute national values and regional aggregates where administrative data are missing, to what extent surveys are used to fill in the blanks in administrative data is impossible to know. The UIS e-Atlas on OOSC appears to rely solely on the latest available administrative data, despite recommendations developed in 2005 by the joint effort between UIS and UNICEF on the use of administrative and survey data sources.



- **Variability in the definition of the target population for the measurement of out of school rates.** Out of school statistics are currently reported by level of education: primary or lower secondary, with the lion's share of attention paid to out of school children of "primary school age." However, there is variation across countries in the starting age of primary education and in the duration of the primary education cycle, resulting in differences in the age groups to which measures of school exclusion are applied. In addition, the focus on primary-age out of school children often masks the challenges facing "older" children (often ages 12 and up), which in some countries fall in the lower secondary level of education.
- **Discrepancies between sources.** In many cases, where both household survey and administrative data are available, the estimates of out of school rates differ. The magnitude of the discrepancy may be substantial, which affects our perception of the school exclusion problem at the most basic level. These differences may stem from conceptual differences between enrollment and attendance, the definition of the target population, and the definition of "in school." In some cases, it appears that some of those who are officially counted as out of school are actually enrolled in preschool or unregistered non-formal education programs. UIS generally considers children enrolled in non-formal schools as out of school.
- **Emphasis on school exclusion by age group, regardless of school level.** This approach involves moving away from the focus on primary or secondary levels of education for international comparisons, and towards a more meaningful measure of school participation of children ages 7 to 14 (which captures the bulk of basic compulsory education in many countries), ensures cross-national comparability of numbers, and supports the normative international frameworks set by the Convention on the Rights of the Child and the International Labor Organization's (ILO) Minimum Age Convention.
- **Expanded definition of "in school."** A closer look at participation in non-formal education, including unregistered private schools and preschools with education content may be warranted. We believe that a more expansive definition of in-school that includes non-formal schooling may be necessary, as there is potential for out of school numbers to be inflated if the statistics are gathered solely based on administrative primary and lower secondary school census data. Where unregistered non-formal or preschool programs are prevalent, data collected through surveys at the household level may provide a more precise gauge of school participation.
- **Greater use of survey data and transparency on use of surveys for imputation of missing values.** As we note above, at this time survey-based out-of-school information is not included in the country level statistics on school participation currently published in the UIS Data Centre or the UIS e-Atlas on Out-of-School Children<sup>1</sup>. In a situation where missing data are a serious challenge, such as in the global measurement of out of school children, reliable sources of information such as household surveys serve to

We recognize that a precise estimate of the number of out of school children may not be attainable, and that substantial resources and technical expertise are needed to address existing gaps and data reliability concerns. However, several steps can be taken to both increase the awareness of the relevant stakeholders to data limitations, and to improve the consistency of data analysis, aggregation, and cross-national comparisons. The recommendations in this report include the following:

<sup>1</sup> During the review of an earlier draft of this report, UIS indicated that survey data will soon be made available through the UIS Data Centre.

improve our understanding of the issue. Also, even when administrative data are not missing, in some cases surveys may offer a better gauge on school participation. Surveys also provide important demographic information, making it possible to identify the most disadvantaged groups of children. For these reasons, survey data can and should be used more widely and transparently for tracking school exclusion on national, regional, and global levels. We recognize the political sensitivities and methodological complexity in the use of surveys, and yet we argue that the principles established in prior efforts allow for a sound and sensible use of available information on out of school children.

- **Broader understanding of data gaps and reliability concerns.** Education stakeholders and analysts at different levels must be aware of data gaps, concerns, and ways to address them. The pervasiveness of missing data at national level warrants a certain amount of sensitivity to aggregated values, particularly those at the regional and global level. In-depth data reviews are necessary to investigate cases where the discrepancies between sources are particularly high. The availability of quality data and

consistency across sources is, without question, an issue that requires substantial investment of resources and expertise. However, without a clear definition of the problem, and clarity and transparency about the high level of uncertainty around what is known, it is difficult to expect improvement in this area. The ongoing Global Initiative on Out-of-School Children, started by UIS and UNICEF in 2010, is focusing on in-depth reviews for 26 participating countries, and it is hoped that this effort will eventually reach all countries.

- **Greater emphasis on measuring the progress at the national and subnational levels.** We can track the countries that have made substantial progress in removing barriers to school participation. The overall trend in most countries has been to improve access to education. Where school participation is near optimal, such as developed countries, the fluctuation of out of school statistics appears spurious. In contrast, long-term trends with larger magnitude are more reliable, such as those that we observe in developing countries. Accordingly, a renewed focus on national and subnational progress may be a reasonable place to start.

## INTRODUCTION

In the two-plus decades since the World Conference on Education for All in Jomtien, Thailand, there has been remarkable progress in expanding access to education around the world, and particularly in low-income countries. However, primary school access is still far from universal: new policies and programs have allowed the “low-hanging fruit” – the children facing the fewest barriers – to enroll in large numbers. As a result, identifying and removing barriers to school access has become a much more complex undertaking, as the focus shifts on those that are hardest to reach. This challenge begins with establishing the scope of the problem: 1) just how big is the out of school population, and 2) what obstacles are they are facing?

The international consensus, set by the UNESCO Institute for Statistics (UIS), is that there are approximately 61 million children out of school at the primary level, and 71 million at the lower secondary level (UNESCO, 2012). Figures are compared across time, and discussions center around stagnating levels of school access in recent years. For example, Global Education Digest 2012 published by UIS (UIS, 2012) states that the out of school population in Sub-Saharan Africa actually increased by two million between 2008 and 2010. Global figures are important for advocacy purposes, as well as for gauging the scope of the challenge, but real measurement of change over time – be it on a global or national level – presumes a certain level of data reliability, as well as an ability to distinguish between true progress and random variation due to measurement error. In this report, we show that more needs to be done globally to strengthen the quality, relevance, comparability, and consistency of international data on school participation.

This report offers a closer look at the estimates of out of school children of primary school age from a variety of sources, underscores the challenge of missing data, and provides a thorough overview of variation in the measurement of this important

indicator. We show where the need for data reviews is the greatest, and propose ways to streamline measurement using the existing array of data collection instruments and sources. We argue that while a perfectly precise estimate of the number of out of school children may not be attainable, certain steps can be taken to build a more complete and comprehensive measure of school participation. Without getting a sensible gauge on the school exclusion problem, progress towards removing barriers to access will be impossible to measure. We do not suggest that effective interventions should be put on hold until the metrics are streamlined – quite the opposite – but we call for greater attention to data issues in order to capture school exclusion at aggregate levels. These days, as resources are increasingly linked to global metrics, it is important for the development community to face data challenges head on by openly discussing our concerns and hopefully devising ways to respond.

The report has two goals: to contribute to the current dialogue on international data and measurement of out of school children, and to play a role in monitoring progress toward Education for All goals. The report begins with a breakdown of the current global estimate of out of school children,

highlighting the main points as well as gaps in available data at the country level. It then provides an overview of the variation in the national counts of out of school children across administrative and survey sources, and discusses the factors that help explain these discrepancies. The report goes on to illustrate challenges in the measurement of out of school children, and show how shifting definitions of “in school” affects estimates in two countries – Kenya and India. The last section summarizes data

and measurement challenges, offers a standardized approach to measuring participation, and calls for greater acknowledgement of data quality concerns. In the appendix, we offer our own estimates of out of school rates and numbers of out of school children in Sub-Saharan Africa and South Asia, the two regions with the largest populations of out of school children.

## CHAPTER 1.

# Where are the 61 million out of school children?

Our starting point is the global estimate of out of school children of 61 million at the primary education level published in 2012 by the UNESCO Education for All Global Monitoring Report and cited by the Global Initiative on Out-of-School Children, an interagency effort between UIS and UNICEF (UNESCO, 2012; UIS, 2012).

UIS defines the number of out of school children as the difference between 1) the number of children of official primary school age who are registered as enrolled in formal primary or secondary school, and 2) the estimated primary school age population (UIS & UNICEF, 2005). The emphasis on the primary level stems from Education for All, which calls for universal primary education, but it complicates cross-national comparisons and fails to illuminate high out of school rates among older children. While simple and intuitive in principle, this measure allows various interpretations of basic parameters, such as the definition of primary education, the definition of “in-school”, sources of attendance and enrollment information, and sources of population data. For example, while primary aged children attending secondary school are considered enrolled, children in the same age group attending preschool would be considered “out of school.” There is also substantial ambiguity around designating enrollment in non-formal programs as “in school.” Varying interpretations of these parameters affect final figures at the local, regional, national, and global levels.

In the decade since the Education for All Summit was held in Dakar, global actors have made several efforts to arrive at a common methodology for synthesizing and analyzing available data in order to derive a single global estimate for out of school children, with variable success. In 2005, UIS and UNICEF

embarked on a comprehensive review of data sources, definitions, and calculation methods, and produced a methodology for establishing the number of out of school children at the national level, using a combination of administrative and survey sources. The document resulted in a global estimate of 115 million children out of school around the year 2000, with most country-level numbers deriving from 1999-2001 (UIS & UNICEF, 2005).

The use of survey data after the 2005 effort has been substantially limited, with a regional Latin America and several country reports produced by the Global Initiative on Out-of-School Children launched by UIS and UNICEF jointly in 2010. Current data published in the UIS Data Centre reflect solely the information from government administrative sources, and the UIS e-Atlas on Out-of-School Children<sup>2</sup> offers administrative-only values that are dated anywhere between 1990 and to 2010. The global and regional estimates are derived largely based on imputed and unpublished values, and a number of countries previously included in out of school children datasets based on their household survey data (UIS & UNICEF, 2005) are missing from both the e-Atlas and the UIS database<sup>3</sup> (Table 1.1).

<sup>2</sup> <http://www.app.collinsindicate.com/uis-atlas-out-of-school-children/en-us>. According to UIS, the e-Atlas presents the latest data on out of school children (as referenced at <http://www.uis.unesco.org/Education/Pages/reaching-oosc.aspx>). See Appendix D for the full list of figures published in the e-Atlas.

<sup>3</sup> UIS database is used as shorthand for UIS Data Centre.

**TABLE 1.1: MISSING AND OUTDATED DATA IN THE UIS E-ATLAS ON OUT OF SCHOOL CHILDREN**

Country	Out of School Children	Year	2010 Primary school aged population
Democratic Republic of Congo	5,598,022	1999	11,546,913
China	4,298,503	1997	88,186,917
Bangladesh	4,018,410	1990	15,931,444
Afghanistan	2,094,750	1993	5,438,394
Haiti	571,243	1997	1,419,680
Chad	561,533	2003	1,913,983
Liberia	225,548	1999	654,919
Madagascar	485,306	2003	2,901,625
Nepal	926,520	2000	3,711,174
Papua New Guinea	256,460	1990	1,035,032
Sudan*			6,794,018
Myanmar			4,003,871
Somalia			1,567,854
Zimbabwe			2,227,059
Sierra Leone			957,767
Libya			750,279

\*Sudan's population includes present-day South Sudan.

Note: Estimated primary school population of the country based on the starting age and duration of primary school as specified by UIS and the corresponding age populations from UN Population Division.

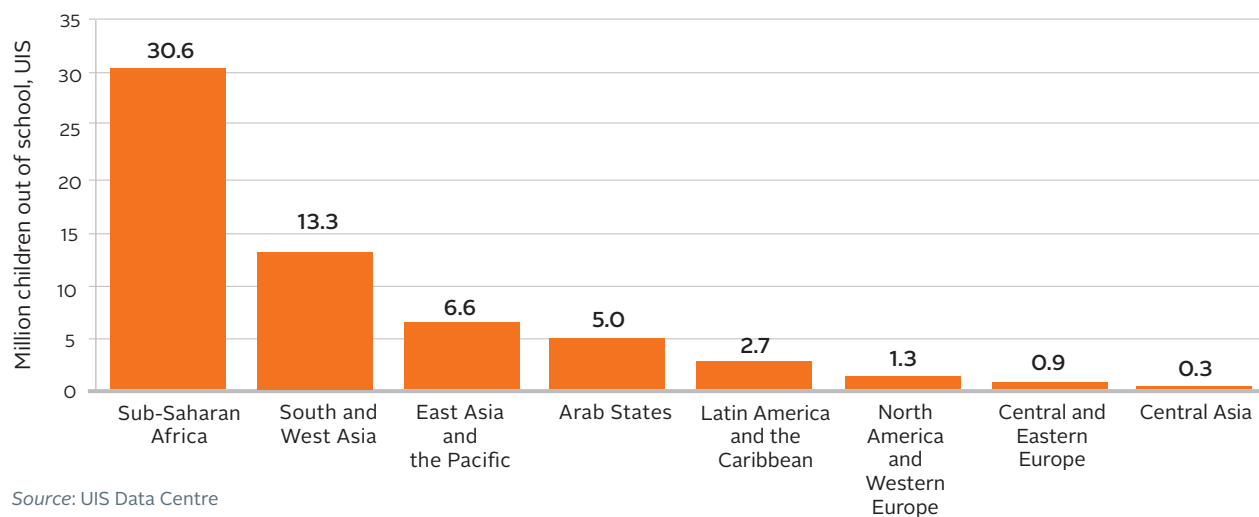
Reliance solely on administrative counts would be a step back from the more comprehensive and insightful approach developed in the previous effort. At this time, it appears that data factored into the global and regional totals cited by UNESCO (2012) was primarily, if not solely administrative. However, as we note elsewhere in this report, because of a lack of information on unpublished values, it is not possible to know to what extent survey data were referenced, if at all. UIS reports that a range of imputation methods may be used to fill in missing country-level values, including use of survey data (UIS, 2008a; UIS, 2012), but estimates

are not published at the national level if there are concerns with data consistency<sup>4</sup>. UIS provides a general methodology for its imputation methods in filling in missing country-level out of school rates and numbers of out of school children on its Frequently Asked Questions page<sup>5</sup>. We reference this methodology here with a brief discussion in Box 1.1 on page 20. At the country level, however, the information on missing values is not publicly available at this time and therefore it is not possible to know

<sup>4</sup> UIS has verbally indicated that a number of different factors (e.g., technical, political, etc.) may impact the reporting of national data.

<sup>5</sup> <http://www.uis.unesco.org/Education/Pages/FAQ.aspx>.

**FIGURE 1.1: UNESCO (UIS) GLOBAL ESTIMATE OF OUT OF SCHOOL CHILDREN (IN MILLIONS), 2011, BY REGION**



Source: UIS Data Centre

which of the missing data on a number of countries are truly missing or merely unpublished. It is equally not possible to know which, if any, survey sources were used to impute data for regional aggregate values<sup>6</sup>. In either case, a high prevalence of missing information in the UIS database and the UIS e-Atlas indicates a high degree of uncertainty surrounding available aggregate figures.

## Breaking it down: the UIS e-Atlas on Out-of-School Children

Regardless of the source of information on out of school children, global estimates are only useful when relative clarity exists about the areas of greatest need, in terms of geography, economic development, stability, and quality of the education system. At this time, only a limited analysis of national-level figures is possible with administrative data: as we note above, roughly 40% of country data on the number of out of school children is not published in the UIS Data Centre. The UIS e-Atlas on Out-of-School Children offers some insights into the most recent available administrative data at the country level<sup>7</sup>. Since it

<sup>6</sup> UIS has indicated that a new guidance document with a methodology to address the problem of measuring out of school children is forthcoming.

<sup>7</sup> For some countries, the e-Atlas provides national estimates of numbers of out of school children that are not available in the UIS Data Centre.

is currently the most comprehensive international dataset on the numbers of out of school children, we use it here as a starting point for the discussion of data challenges and considerations in the measurement of school exclusion.

### Geographic distribution.

The regions with the largest contribution to the global number of out of school children are Sub-Saharan Africa and South Asia, with over 70% of the global total. These two regions are characterized by high overall population levels and high rates of exclusion, and are home to the two greatest contributors to global out of school estimates: Nigeria, with 10 million, and India, with 2.3 million (or 21 million according to household survey data, elaborated in Chapter 3). Of 14 countries with one million or more children out of school, only three are located outside of these two regions. Although countries around the globe, including those in North America and Europe, may at times struggle to provide all of their citizens with stable access to schooling, the geographic breakdown indicates that exclusion from schooling disproportionately impacts the global South (this pattern holds regardless of the source of the data).

### Economic wealth.

Examining the distribution of out of school children by national wealth provides another useful angle for analysis (Figure 1.2). The World Bank's income group classification, which is based on gross national income per capita<sup>8</sup>, shows that over 90% of the UIS global total comes from low and lower middle income countries. To some extent, this is due to their disproportionate share of world's population (over 70%) as they include some of the world's most populous countries (i.e. India, Bangladesh, Ethiopia, and Nigeria). However, this should not mask the fact that out of school rates are also highest in low income states. Over two decades since Jomtien, national wealth is still a strong predictor of school participation: the poorest countries in 1990 (Jomtien) and 2000 (Dakar) are still more likely to have higher out of school rates than wealthier states (Figure 1.2).

<sup>8</sup> World Bank country and lending groups

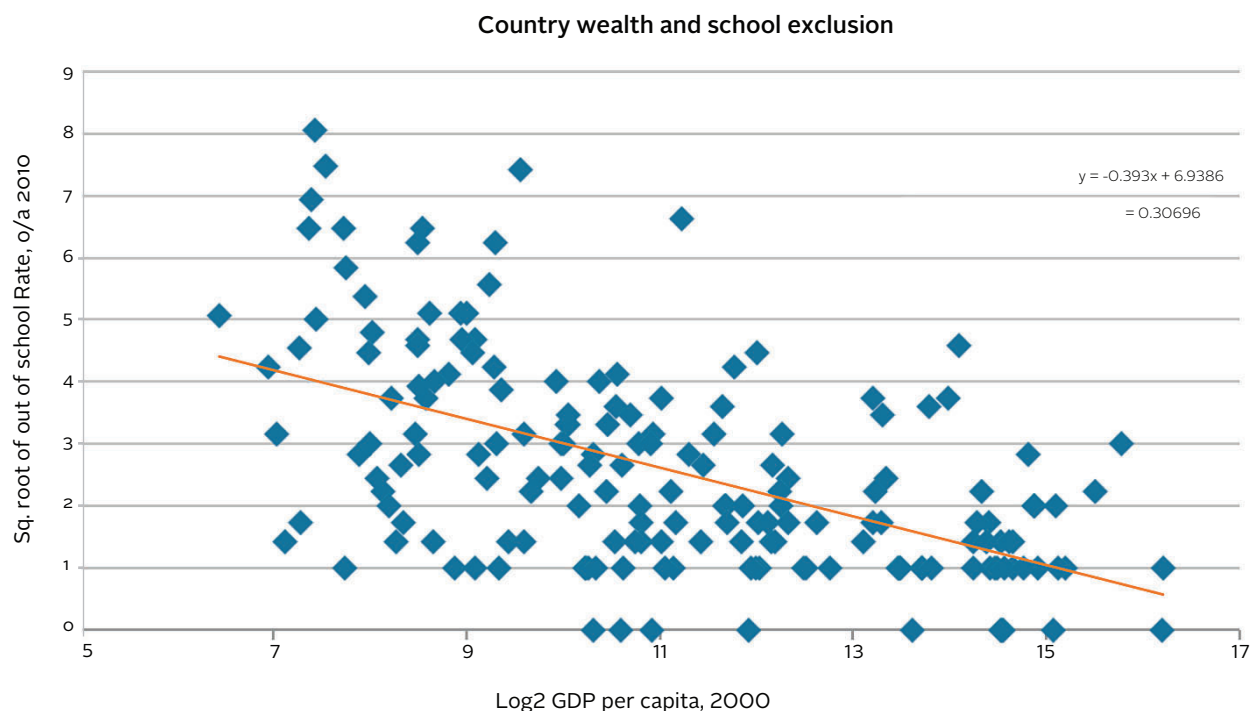
In each of the income groups, there are clear outliers (Figure 1.3). Notably, in the UIS e-Atlas<sup>9</sup>, 54% of out of school children across the low income group are in just four countries: the Democratic Republic of the Congo, Bangladesh, Ethiopia, and Afghanistan<sup>10</sup>. In the lower middle income group, Nigeria and Pakistan together account for over half of the number of out of school children, due to their sheer size. The same is true for India: even with an official out of school rate of only 2%, the sheer size of the population in India makes it a major contributor. A household survey completed in 2006 puts the out of school rate closer to 17%, which changes the estimated number of children to nearly 21 million<sup>11</sup>. While the

<sup>9</sup> The UIS e-Atlas is used as shorthand for the UIS e-Atlas on Out-of-School Children.

<sup>10</sup> UIS Data Centre publishes OOSC rates for Afghanistan; the figures in the UIS e-Atlas are from 1993.

<sup>11</sup> The DHS survey indicates that the non-attendance rate in India was 17% in 2006, even as UIS showed an out of school rate of 5% in the same year, and 2% two years later. In Chapter 3, we offer a more detailed discussion of the complexity of out-of-school children estimate in India.

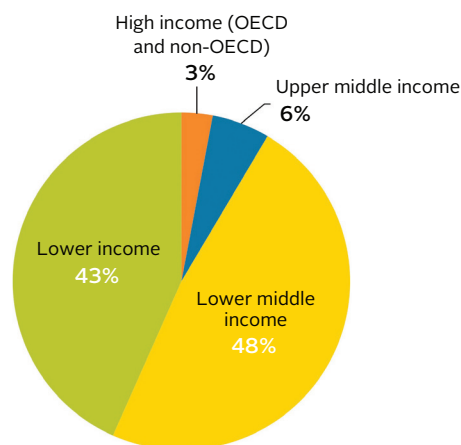
**FIGURE 1.2: INVERSE RELATIONSHIP OF COUNTRY WEALTH (GDP PER CAPITA IN 2000) AND OUT OF SCHOOL RATE TEN YEARS LATER (O/A 2010)**



Source: GDP per capita in constant US\$, 1990: World Bank; Out of school rate for primary education, o/a 2010, percent (square root): UIS Data Centre



**FIGURE 1.3: DISTRIBUTION OF OUT OF SCHOOL CHILDREN BY INCOME GROUP**



Source for income data: World Bank country and lending groups  
Source for out of school data: UIS

proportion of the global total coming from high and upper middle income states is relatively small, it is notable that national-level figures are over 100,000 in ten high and upper middle income countries, including over 1.2 million out of school children in the United States<sup>12</sup>.

### Conflict-affected countries.

Determining the number of out of school children in conflict-affected countries is a particularly difficult challenge, given the frequent lack of access to reliable data, population shifts, and fluid definitions of school enrollment. However, fragile and conflict-affected countries may require the most focused attention, as the global education community strives to identify groups that are still being denied access to primary education. In the 2011 Education for All Global Monitoring Report (GMR), which focused on education in conflict states, UNESCO stated that there were 28 million out of school children in conflict-affected countries (UNESCO, 2011). The task of establishing how and to what degree a country's out of school rate might be impacted by internal or external conflict is complex, and circumstances surrounding each country's fragility vary a great deal. Relatively large countries may have internal conflicts

<sup>12</sup> UIS and UNICEF (2005) note that estimates for the United States may be potentially inflated due to late start of primary and home school participation (p. 25)

that are localized to specific regions and may only impact a sub-group of children. Recognizing this, UNESCO has discussed the potential of using sub-national population figures to estimate the number of out of school children affected by conflict in India, Nigeria, Pakistan and Indonesia (all large countries facing regional violence) to produce the non-inflated global estimate in the GMR (Montjourides, 2013). However, there is not a good methodology for measuring access to school in refugee camps. For the most part, refugee education programs are considered non-formal, and enrolled children are not counted as "in school" (Ibid). As we examine the UIS numbers and map the countries experiencing conflict between 2006 and 2009, based on the Armed Conflict Dataset developed by the Uppsala Conflict Data Program, we find there are roughly 38 million out of school children in conflict affected countries - roughly 62% of the total UIS global estimate<sup>13</sup>. Among these, Nigeria, Pakistan, DRC, and Ethiopia have the highest numbers of out of school children (see Figure 1.4).

### Overall access to education.

A breakdown of the on-age enrollment allows us to see to what extent the number of out of school children reflects real challenges in access as compared to fluctuations of population or measurement error around administrative estimates (as might be the case in countries where the out of school rate is less than 5%, which is likely to fall within the margin of error). We use the net enrollment rate<sup>14</sup> (NER) to divide countries with published UIS data into "high access" (NER above 95%), "medium access" (NER of 80-95%) and "low access" (NER below 80%), and examine the degree to which countries in these categories contribute to the global number of out of school children. Most NER data are from 2005 to 2010.

<sup>13</sup> We removed the United States from the UCDP list since it did not experience armed conflict within its borders during 2006-2009, and was included due to the Global War on Terror efforts by the US Government. We felt that this definition of conflict was not relevant for the purposes of this analysis.

<sup>14</sup> Net enrollment rate for primary education reflects the number of children in primary school, as defined by ISCED, as a percentage of children of the corresponding age group.

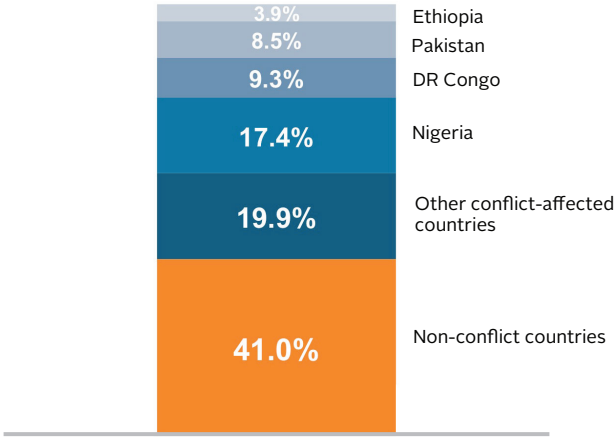
Where data were not available for this time period, the most recent available data were used<sup>15</sup>.

As Figure 1.5 shows, most out of school children are in “low access” countries. Just over 22 million out of school children reside in “medium access” countries, and nearly seven million are contributed by “high access” countries (mainly as a result of sheer population size). In countries where estimated on-age enrollment is equal to or higher than 95%, access to primary education is generally accomplished, and only a small margin is left for measuring the number of out of school children. Consequently, these calculations are more susceptible to measurement error and require greater caution in interpretation and inclusion in the regional and global totals.

UIS Data on OECD countries, which generally enjoy

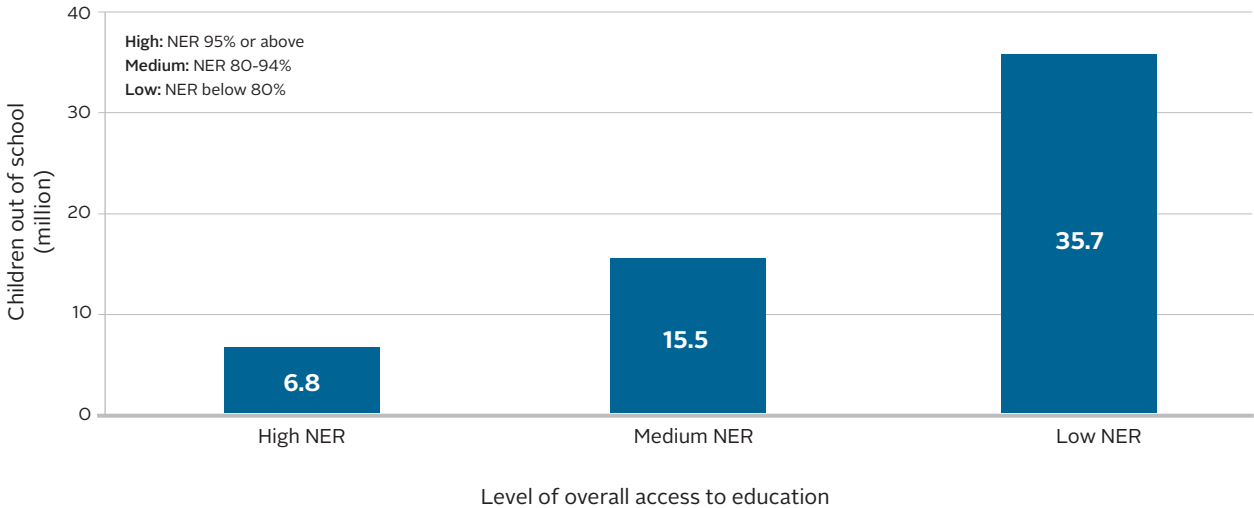
<sup>15</sup> A number of small countries did not report NER and therefore could not be included in this breakdown, such as Papua New Guinea, Czech Republic, Austria and Slovakia. Some larger countries had neither NER nor out of school data available: Libya, Myanmar, Sierra Leone, Somalia and Zimbabwe. In total, 15 of 18 countries that did not have NER also had missing or outdated out of school data.

**FIGURE 1.4: PERCENTAGE OF OUT OF SCHOOL CHILDREN BY COUNTRY AND CONFLICT STATUS**



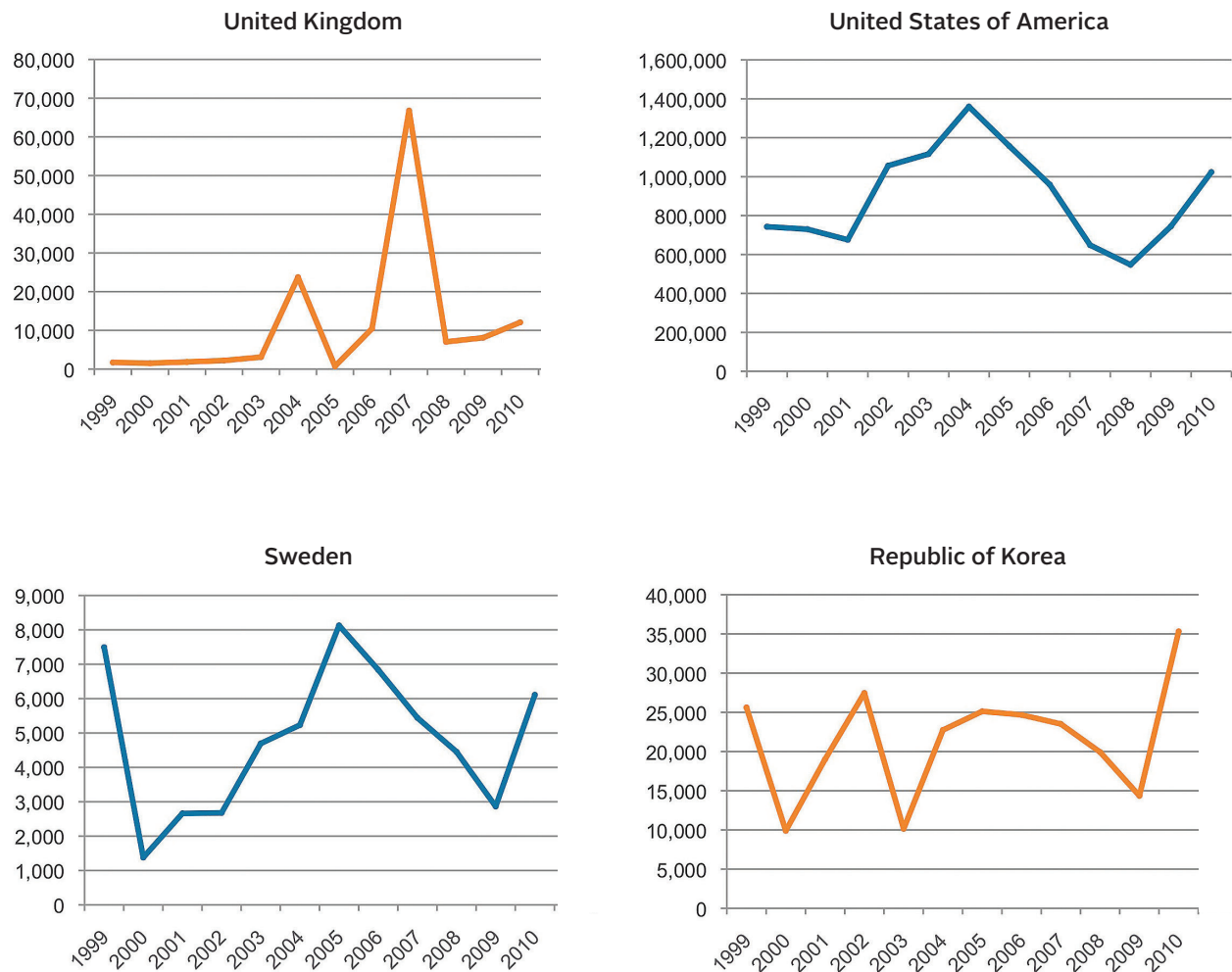
Source: Uppsala Conflict Data Program, UIS Data Centre

**FIGURE 1.5: NUMBER OF OUT OF SCHOOL CHILDREN (IN MILLIONS), BY OVERALL ACCESS TO EDUCATION GROUPING**



NER source: UIS Data Centre

**FIGURE 1.6: NUMBER OF OUT OF SCHOOL CHILDREN IN SELECTED DEVELOPED COUNTRIES, 1999-2010**



Source: UIS Data Centre

a high level of access to both primary and secondary education (NER above 95%), illustrate the effect that measurement error may have on estimates of out of school children in such settings. In a brief departure from our breakdown of the UIS e-Atlas data, Figure 1.6 shows the numbers of out of school children in selected OECD states published in the UIS Data Centre as a time series. As the graph demonstrates, there is substantial variation in the number of out of school children in these countries, in some cases ranging from tens of thousands to a few hundred within two to three years. Since no known calamities

or massive back-to-school efforts occurred in the time period shown, it appears that measurement error—both in the rate of out of school children and in the underlying population—may be playing a much larger role in establishing these numbers than is desirable. Given the increased risk of error for developed countries (trends in other, lower income countries are substantially more stable), we must exercise caution when including these figures in global totals.

### BOX 1.1: FILLING IN THE BLANKS

Because so much data on out of school children is missing, imputed estimates are used in place of missing country-level values to be factored into the regional and global totals. Generally, the imputation methods used by UIS\*\* include:

1) Extrapolation of a linear trend in a statistically correlated indicator (e.g. pupil-teacher ratio for private schools, based on the known rate of change in pupil-teacher ratio for public schools). The nature of the out of school indicators (both the rate and the number of out of school children) is not conducive to the use of this method, with the possible exception of out of school rates between levels of education – however, it is rarely the case that the rate for one of the levels would be present as a time series when the other is not.

2) Extrapolation using the value for year closest to the year of the missing value. This involves forward extrapolation of the most recent values to subsequent years with missing data, backward extrapolation of the earliest available data, and linear interpolation when values are available for the years before and after the year in question. This method may be used for out of school indicators; however, it requires adjustment both for the changes in population (for the number of out of school children) and certain assumptions about the behavior of the proportion-based indicators (i.e. out of school rate). The size of the error in such cases hinges on the length of the available time series and the number of years for which data need to be estimated.

3) Group mean imputation, using unweighted group mean for the geographic region. UIS notes that this method is not applied to countries with large populations (e.g. China), and for several countries missing values are imputed by hand – possibly with the use of other available sources, although the sources used for this purpose are generally not specified. Such estimates are not publishable at the country level\*\*. Group mean imputation works best when the amount of missing data within the group is small, and the observations with missing data can reasonably be considered typical of the group.

UIS reports that all or a combination of these methods may be used to generate estimates that are then factored into group aggregates, and decisions are made on case by case basis. Detail on which methods are used in which case is not public knowledge at this time. By the same token, to what extent survey-based data are used for manual imputation is not public knowledge, although a fuller methodology document is reportedly forthcoming.

\*\*See UIS Frequently Asked Questions at <http://www.uis.unesco.org/Education/Pages/FAQ.aspx>

## Where are the data gaps?

As the breakdown of the UNESCO global estimate of out of school children has shown, the challenge does not equally affect all countries. It is disproportionately concentrated in the global South, especially in the low- and lower-middle income countries of Sub-Saharan Africa and South Asia, and nearly two-thirds are in countries that have experienced recent violent conflict. Though these trends seem to be clear, the pervasiveness of missing data on out of school children, particularly at the country level, is a continuing, and serious, challenge. For 2010, UIS data were not published for 22 out of 45 countries in Sub-Saharan Africa, for 14 out of 42 countries in Latin America, and 4 out of 9 countries in South Asia<sup>16</sup>. Even as imputed estimates for these countries were factored into the global total<sup>17</sup>, the lack of published values at the national level indicates

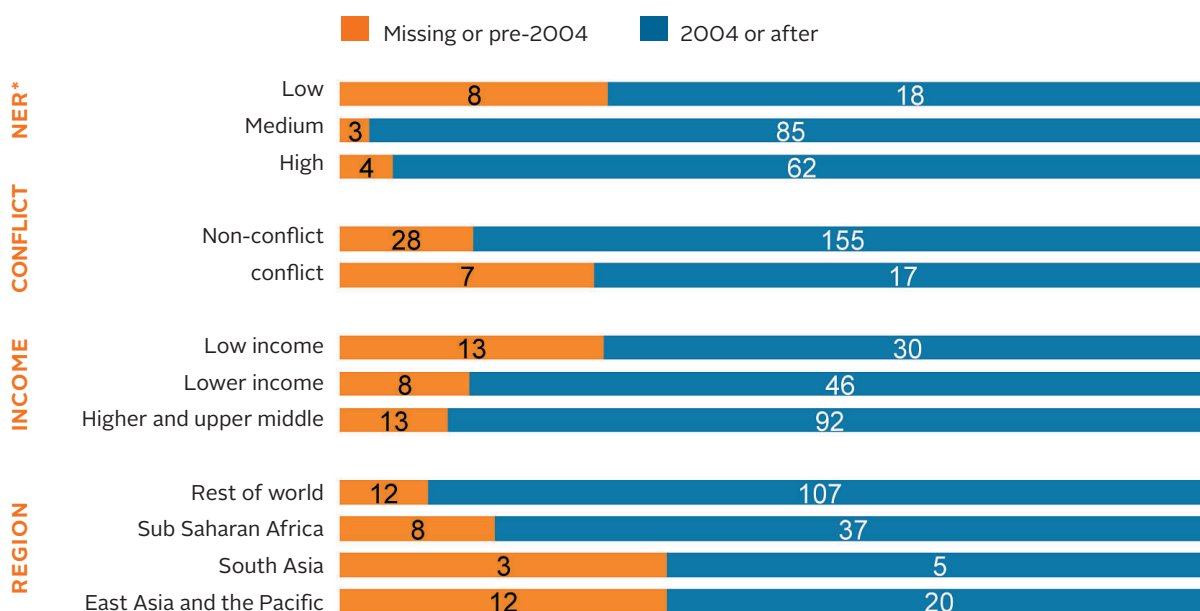
<sup>16</sup> Based on data downloaded on 3.13.13.

<sup>17</sup> The available national figures do not add up to the regional and global totals. As noted above, UIS indicates that a variety of methods can be used to impute missing values, including the use of survey data (UIS, 2008a). However, information on what the estimates were and how they were derived in each case has not been published.

that the estimates used in place of the missing data were not deemed publishable at the national level by UIS (UIS, 2008a; UIS, 2013). See Box 1.1 for information on the imputation methods used by UIS. Imputed estimates, regardless of the method, necessarily carry a substantial degree of error. The greater the level of missing and imputed data in the dataset, the wider the bounds of error at higher levels of aggregation.

As noted above, the UIS e-Atlas uses the most recent available data to derive the global figure, and is more liberal in the publication of older data where it is available. In total, as Figure 1.7 shows, 23 out of 85 countries in Sub Saharan Africa, South Asia, and East Asia and the Pacific had missing figures, with outdated values published through the e-Atlas, compared to 12 out of 119 countries for the rest of the world. These countries account for approximately 23% (or 8% without China) of the global population of primary school age (Table 1.1). Some of them, such as post-secession Sudan, South Sudan, and Sierra Leone are certain to be facing substantial challenges in terms of access to primary education. Greater effort is necessary to address these gaps: with over half of country-level numbers factored into the global

**FIGURE 1.7: OUT OF SCHOOL ESTIMATES, MISSING OR OUTDATED, COMPARED TO TOTAL**



\*15 of 18 countries that did not report NER also had missing or outdated out of school children estimates.

total either missing or imputed, it is an open question as to the bounds of error and uncertainty around the figure of 61 million primary aged out of school children around the world, referenced in the 2012 UNESCO Global Monitoring Report (UNESCO, 2012).

Finally, while this publication focuses on data and measurement issues for out of school children, we must recognize that an equally important metric—currently enrolled children at risk of dropout—is gaining ground in the global conversation, in large part due to the framework first put forth by CREATE, a research center at the University of Sussex (Lewin, 2007). The Five Dimensions of Exclusion (5DE) framework, developed by the Global Initiative on Out-of-School Children, which draws on the CREATE model, also provides a useful lens for understanding the dynamics of school exclusion, pointing out the differences between children who never enrolled and

those who have dropped out or have low attendance (UIS & UNICEF, 2011). Data challenges are likely even greater in this realm, but the potential payoff—reducing the probability of dropout—cannot be set aside.

In the next chapter, we examine the sources of variation in the measurement of school exclusion, which will help us understand the bounds of uncertainty around this figure. We examine available data for a set of countries where both administrative and survey sources provide enrollment/attendance information in the same year, and highlight the important factors that must be taken into account in measurement and policy planning around challenges related to school participation.

## CHAPTER 2.

# Sources of variation in measurement of school exclusion

At this time, measurement of out of school children is disaggregated by age ranges corresponding to levels of education (UNESCO, 2012), with the greatest focus, per the Education for All agenda, paid to those of “primary school age.” However, determining the extent of school exclusion for primary education involves working with malleable definitions of the primary school cycle and different measures of school participation that vary by data source. These factors produce significant variations in estimates of out of school children.

For example, 2011 estimates of primary-aged out of school children in Ethiopia range from 1,702,685 or 13% (using UIS administrative estimates and an ISCED<sup>18</sup> definition of primary school) to 5,773,946 or 33% (using household survey data and Ethiopia’s definition of primary school). These disparate estimates raise more questions than answers about the extent of school participation in Ethiopia and other countries with similar discrepancies.

In this chapter, we provide an overview of the sources of variation based on detailed data reviews of the 40 countries in Sub-Saharan Africa and South Asia that have household survey<sup>19</sup> or census data<sup>20</sup> available for 2006 or later (see Figure 2.1 for a map of these countries and Appendix A for a list of household survey and census data used). For each country, we reviewed estimates of out of school populations from household survey and census sources as

<sup>18</sup> UNESCO’s International Standard Classification of Education or ISCED helps classify education levels for purposes of cross-national comparison. Throughout the paper, ISCED refers to the ISCED 1997 classifications that were still in use at the time of writing.

<sup>19</sup> EPDC used Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS).

<sup>20</sup> IPUMS (Integrated Public Use Microdata Series) Census sources provide a sample of census data that can be used to derive estimates of school participation. These were used for South Sudan and post-secession Sudan to provide an alternative to administrative estimates and a source of subnational details on disparity.

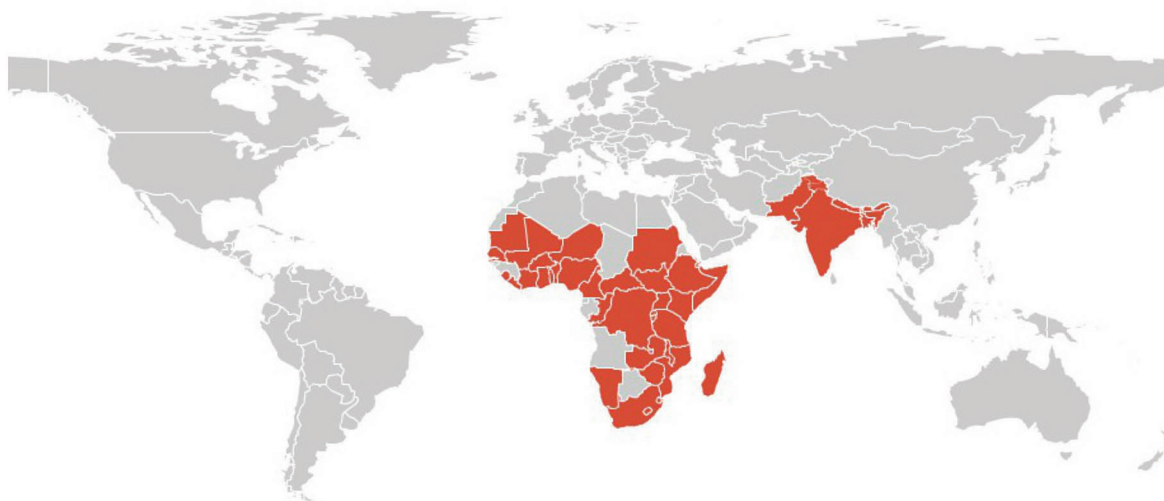
well as UIS administrative estimates<sup>21</sup> available for the same year as the survey estimates. We identified inconsistencies in the definitions of primary education across sources, data gaps at subnational levels, and other factors contributing to measurement error. We discuss these factors below, along with concerns related to the timeliness and availability of data, and the importance of examining patterns of inequality among subpopulations, which also influence the interpretation and utility of estimates.

Estimates of school exclusion are very sensitive to definitions and data sources. Though ISCED and national definitions of how many grades constitute primary education align for most countries, there are cases where they diverge. In those cases, ISCED durations of primary are usually shorter and therefore tend to result in lower counts of out of school children of primary age in comparison to national definitions.<sup>22</sup> Furthermore, both definitions

<sup>21</sup> The UIS administrative figures used in this chapter were last downloaded from the UIS database on May 6, 2013. UIS collects data from national government administrative sources.

<sup>22</sup> ISCED-based lower secondary durations, on the other hand, may be longer than national lower secondary definition—in such cases, the combination of the two levels would roughly match the nationally defined compulsory education cycle.

**FIGURE 2.1: COUNTRIES CONSIDERED IN ANALYSIS OF OUT-OF-SCHOOL POPULATIONS**



of the primary cycle limit the comparability of data (a) across countries—as different countries are accountable for different primary durations; (b) over time—as cycle durations and entry ages may shift through the years; and (c) within countries—as national definitions obscure subnational variations in primary cycles.

Data sources also contribute significantly to variation because of the different measurements of school participation they employ and the methods they use to count participation. In short, household surveys measure school attendance, at least once during the year, as reported by the household head and often leave out critical populations that do not live in traditional households. Administrative sources, on the other hand, measure school enrollment and are more likely to exclude children participating in educational programs outside the formal educational system. Finally, decisions about which data source to employ are sometimes further complicated by tradeoffs between timeliness and detail. For the set of 40 countries in Sub-Saharan Africa and South

Asia, administrative figures (collected annually) are typically more current than household surveys (conducted every several years) while household surveys offer much richer views of inequality in school participation among subpopulations that are critical to the design of effective interventions. School-based statistics also have the benefit of direct linkage to other school input measures, such as the numbers of teachers, infrastructure, expenditure, and in some cases, learning outcomes, which are critical for understanding the performance of an education system. Household surveys offer the wealth of information on the families and the socioeconomic aspects of the environments surrounding students. Ideally, it is the combination of survey-based information with the education management information systems (EMIS) collecting with administrative enrollment data that would allow for the most comprehensive analyses of barriers and successes in education.



## Starting ages and durations of primary education

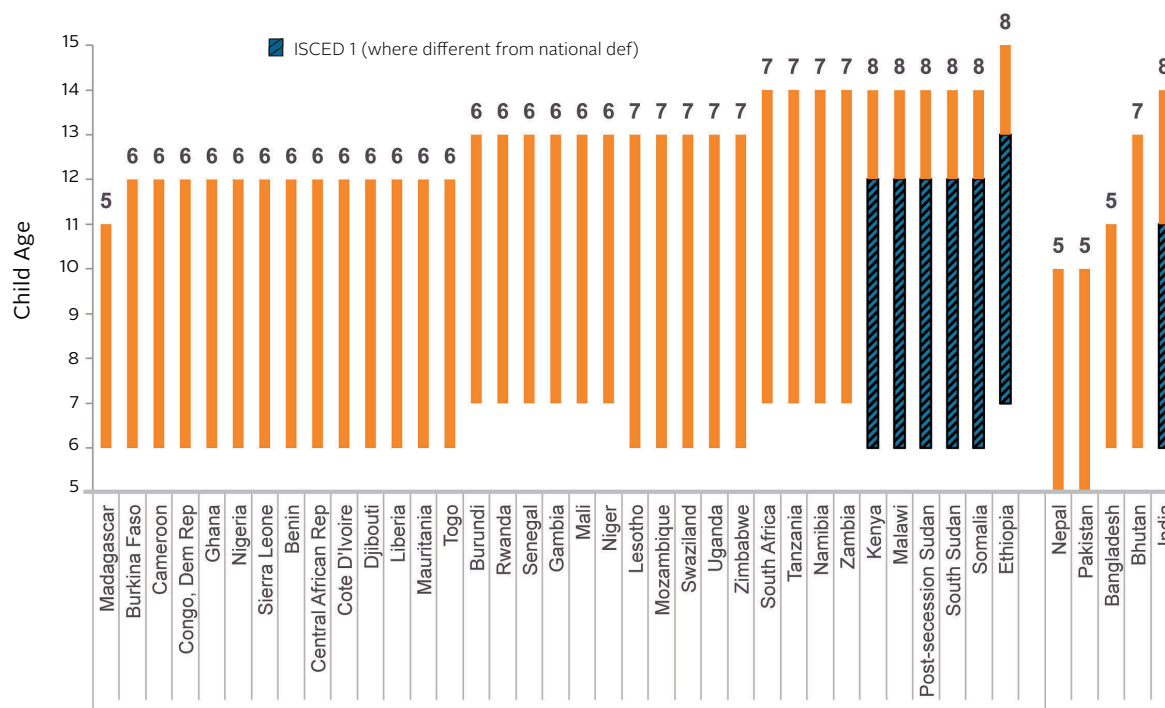
As we note above, some of the variation in measures of out of school children stem from the default position in which children are disaggregated by level of education—with the focus on primary education. What constitutes primary education, however, is subject to interpretation, and cross-country variation exists around the starting age for primary enrollment, as well as the duration of the primary schooling cycle. As a result, countries with a longer primary education cycle are naturally contributing proportionately higher numbers to the global estimate of out of school children than they would had they set primary cycles shorter. Most notably, however, differences exist between the definitions of primary education established by national Ministries of Education and the international definitions set by UNESCO's International Standard Classification of Education (ISCED). Whereas national definitions privilege local over international understandings of primary

education, ISCED compares diverse national school cycles against internationally standardized levels (e.g. ISCED 1 for primary education) (UIS, 2008a; UIS, 2008b). In some cases, this involves reinterpreting national definitions and results in diverging estimates of the primary school-aged population.

Figure 2.2 displays the theoretical starting ages and durations of the primary education cycle according to national definitions and, where different, ISCED definitions for the 40 countries considered in this chapter. The national definitions of primary have entry ages from five to seven with an average starting age of six years, and durations of primary from four years to eight years with an average duration of seven years. ISCED-1 entry ages align with national policy; however, ISCED-1 durations range from four to only seven years. ISCED always revises eight-year national primary cycles downwards<sup>23</sup>; the general pattern is for ISCED to preserve national definitions

<sup>23</sup> Ireland, which retains its eight year primary cycle in the ISCED 1997 classification and is not revised downwards, is an exception.

**FIGURE 2.2: LENGTH OF PRIMARY EDUCATION ACCORDING TO NATIONAL DEFINITIONS AND ISCED DEFINITIONS.**



Note: Duration of the national cycle is labeled above each bar.  
Sources: UIS Data Centre and UNESCO International Bureau of Education

of primary except where they are prolonged. Indeed, it is the seven countries in the reviewed dataset with primary durations of eight years (Ethiopia, India, Kenya, Malawi, Somalia, South Sudan, and post-secession Sudan)<sup>24</sup> that have different ISCED-1 durations. For the African countries, the ISCED-1 estimate is six years. For India, ISCED defines a five-year primary cycle, which aligns with the national definition of lower primary but misses an additional three years of upper primary. ISCED-based estimates of out of school children at the primary level are thus substantially lower in such countries than they should be. The impact of these definitional differences on numbers of out of school children for countries is most dramatic in populous countries such as India and Ethiopia, which had populations of 1.2 billion and 83 million respectively in 2010, according to the United Nations Population Division (UNPD, 2011). In these countries, the expansion of age brackets may add millions to national estimates of the number out of school children. Further in this

report, we argue that a standardized age bracket of 7 to 14 year olds for the measurement of out of school children is a sensible resolution for this measurement inconsistency.

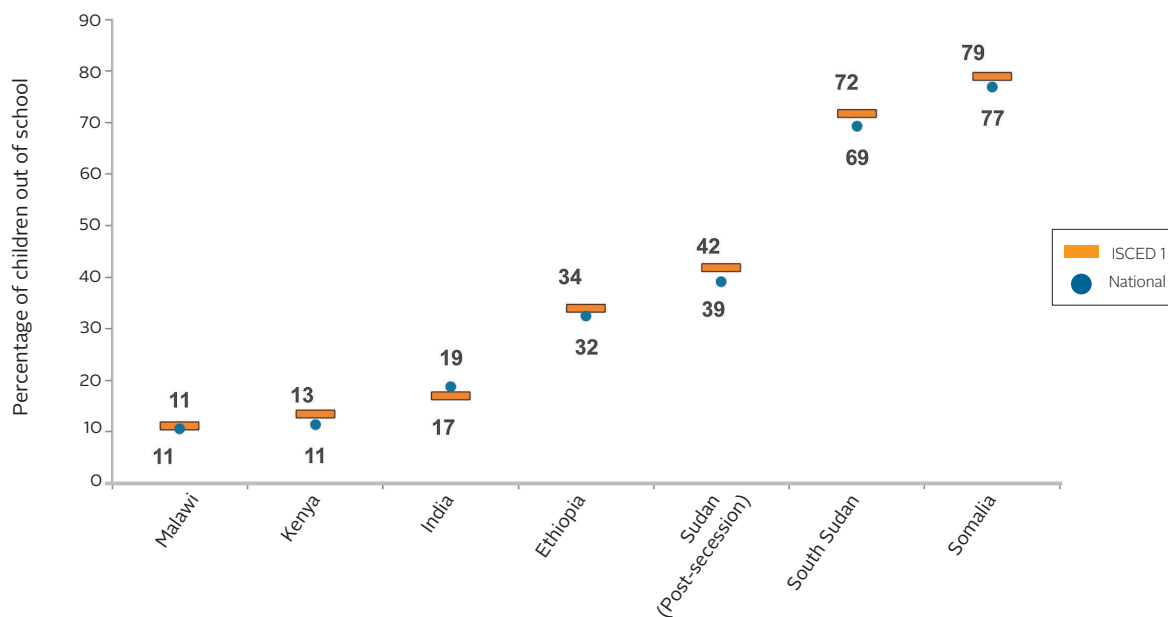
As Figure 2.3 demonstrates, comparison of out of school rates according to ISCED versus national definitions cause a difference of between 0.5% (Malawi) and 2.6% (post-secession Sudan). In six of the seven countries with 8-year primary cycles (all but India), the longer national definition of primary resulted in a lower percentage of out of school children. The cases of Kenya and India are discussed in greater depth in the next chapter.

### Benefits and limitations of national and ISCED conceptions of primary education

ISCED and national definitions of primary both create certain obstacles to comparison, specifically issues with *cross-national* comparison, comparison *over time*, and, in some situations, comparison *within countries*. First, issues with comparability *across countries* arise because durations of primary vary from country to country, more for national definitions

<sup>24</sup> The 2008 IPUMS dataset for pre-secession Sudan has been used with the territories associated with post-secession Sudan and South Sudan.

**FIGURE 2.3: COMPARISON OF RATES OF OUT OF SCHOOL CHILDREN OF PRIMARY AGES BY ISCED AND NATIONAL DEFINITIONS OF PRIMARY**



Sources: DHS; MICS for Somalia; IPUMS for Sudan and South Sudan

than ISCED ones. This means countries with longer primary durations are accountable for greater volumes of children than countries with shorter durations of primary. These countries are thus held to a higher standard (Lloyd and Hewett, 2003). For example, household surveys show 32% as the out of school rates for children of primary age in both Nigeria (2008) and Pakistan (2007). Yet the national duration of primary was five years in Pakistan and six years in Nigeria. As a result, Nigeria is held accountable for an additional age bracket, making it difficult to compare cross-nationally.

Additionally, as education systems evolve, definitions of primary may shift within individual countries. Where primary cycles have changed, it is difficult to track developments in educational participation *over time*. For example, in 2003 ISCED registered a change in the Syrian national definition of primary school from six to four years. This shortening of the primary cycle coincided with a sudden drop in the estimated numbers and rates of out of school children in Syria between 2002 and 2004, using figures from UIS (see Figure 2.4). In these cases, sudden increases in school participation rates may reflect structural changes rather than substantive improvements in access to education.

Measurement is also complicated by changes in the entry age for primary school, as occurred in Burkina Faso in 2010. Estimates of out of school students of primary age rose from 983,031 in 2009 to 1,128,293 in 2010, disrupting the pattern of consistent decreases in out of school figures since 2003. The fact that this increase coincided with the adjusted entry age may reflect difficulties with enrolling a younger age cohort. In addition, this means that the same age groups are not being observed over time. Looking at change in educational systems since 1990, 11 of the 40 countries<sup>25</sup> (28%) included in this review had considered changes either to the entry

<sup>25</sup> Sub-Saharan Africa: Burkina Faso, Djibouti, Gambia, Liberia, Mozambique, Sierra Leone, South Africa, Zimbabwe; and South Sudan and post-secession Sudan (based on changes in the structure of primary education in pre-secession Sudan); South Asia: Bangladesh, Bhutan, India, Nepal, and Pakistan.

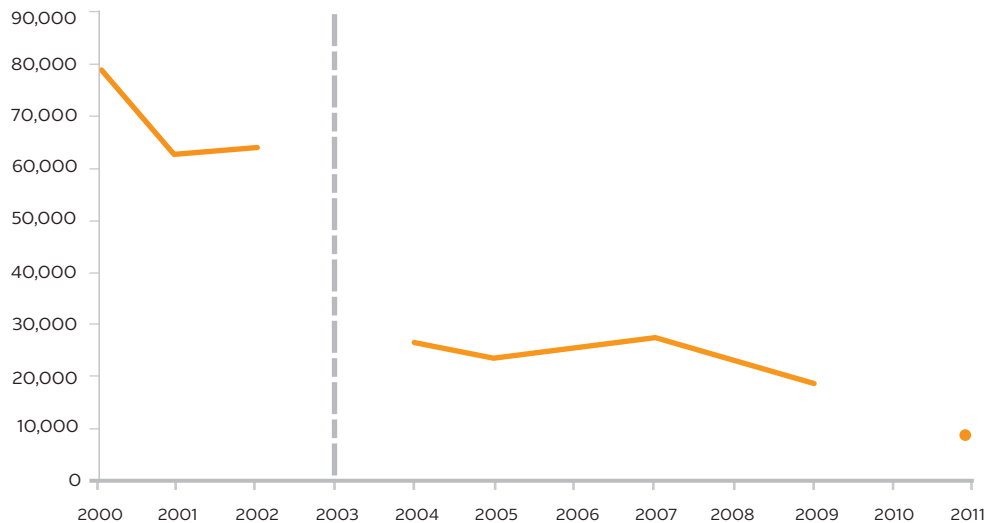
age or to the duration of primary, compromising the comparability of education data over time.

Finally, definitions of primary may vary within some countries with the result that a set definition describes the education cycle accurately for some programs, but not for others. This may occur where non-formal education providers define alternative primary cycles or where decisions about educational structure are decentralized to subnational education authorities. India is a notable example and is discussed in more depth in the following chapter.

The structural variation in primary school within and across countries, as well as over time, poses a challenge to assessing the extent of school exclusion. ISCED makes an important contribution to comparability, synchronizing measurement with the Education for All Goals. But if the goal is to understand where out of school challenges are the most severe around the world—particularly for the crucial early primary grades—a better foundation for comparability is needed. One possible solution to streamline international comparability is to define the relevant population by a single, standard age range across countries<sup>26</sup>, such as 7-14 year olds, rather than by education levels. This would allow the debate to move beyond definitions, ensure that new data are comparable over time, and allow national progress in removing barriers to school participation to be evaluated against a single common metric. Significantly, it would help gauge where the out of school crisis is most acute and lay the groundwork for effective, targeted interventions. In the appendix we offer estimates of out of school rates and numbers of out of school children that calculated from the microdata of major household surveys for 7-14 year olds.

<sup>26</sup> See also UIS (2004). UIS observes that using a standard age range can aid international comparison of statistics and notes that The World Summit for Children Indicators adopt this approach in looking at attendance for children ages 6-12.

**FIGURE 2.4: OUT OF SCHOOL CHILDREN OF PRIMARY AGE IN SYRIA.**



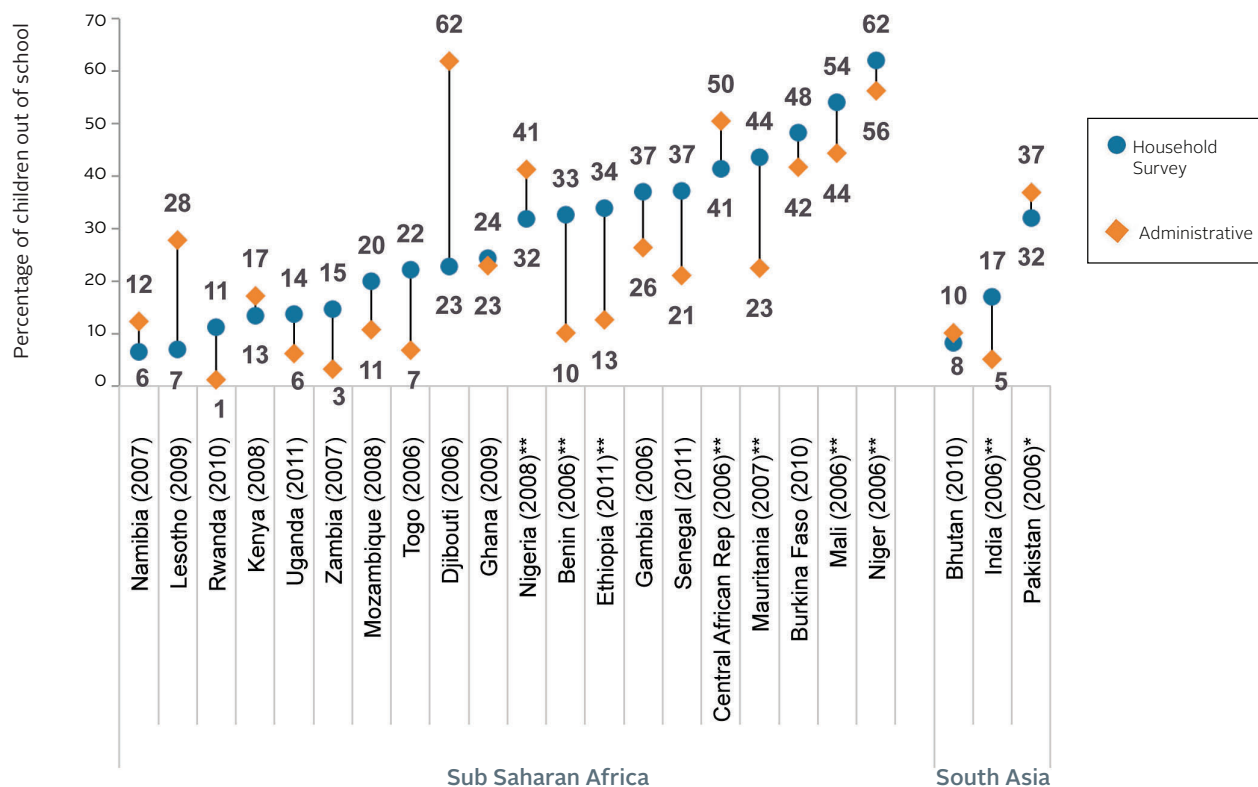
Note: 2003 shift in duration of primary education from six to four years is marked.  
Source: UIS Data Centre

## Variation across administrative and survey sources

In addition to variation in definitions of primary school, measurements of school participation differ by source, depending on what is considered school participation and what method of data collection is used. Figure 2.5 shows this variation by comparing rates of primary-aged out of school children for the 23 countries that have household survey and UIS administrative data available for the same year. The gaps between estimated out of school rates from different sources range from 1.4 percentage points in Ghana (2009), to over 20 percentage points in Lesotho (2009), Djibouti (2006), Benin (2006), Ethiopia (2011), and Mauritania (2007). In cases where the gaps are significant, one obtains starkly different stories of school participation depending on the source. In 15 out of 23 cases, household survey data demonstrated higher out of school rates than the administrative data used by UIS.

The relative differences in rates that are shown in Figure 2.5 translate into large disparities in the volume of out of school children in each country. In India, for example, the 12 point discrepancy between 2006 Demographic and Household Survey (DHS) and same year figures in the UIS database amounts to an additional 14.6 million children out of school. In Ethiopia, the 21 point discrepancy between the 2011 DHS and same year UIS figures means that estimates of out of school children fluctuate by 2.9 million children, depending on the source is used. These dramatic variations necessitate a closer look at data sources, which vary in their measurement of school participation (attendance versus enrollment) and by which school systems and subpopulations are measured. This variation invites a review of what each source contributes to our understanding of out of school figures.

**FIGURE 2.5: COMPARISON OF RATES OF OUT OF SCHOOL CHILDREN OF PRIMARY SCHOOL-AGE (BASED ON ISCED) ACCORDING TO SAME YEAR HOUSEHOLD SURVEY AND UIS ADMINISTRATIVE SOURCES.**



Note: Where countries are marked with \*\*, UIS has indicated that values are UIS estimates. Where countries are marked with \*, UIS has indicated that values are national estimates.

Sources: Administrative estimates taken from UIS Data Centre; household survey estimates are from DHS except for Central African Republic, Djibouti, Gambia, Mozambique, and Bhutan, which are from MICS

Discrepancies occur partly because of the different ways that administrative sources and household surveys measure educational participation<sup>27</sup>. Administrative sources take enrollment figures from school registers or teacher counts of student attendance on a given day to determine the number of primary-aged students enrolled in school. Following the UIS definition, subtracting this number from the total population of the same age range

results in the number of primary aged children out of school. This method may result in either over- or under-estimates of the true number of out of school children, depending on the relationship between school registration and actual school attendance patterns. Specifically, as was pointed out by UIS and UNICEF (2005), enrollment-based figures will underestimate the number when children enroll but do not attend, and will over estimate when students attend after enrolling late. Enrollment figures may also be inflated in situations where government resources are linked to enrollment statistics, giving schools an incentive to boost their school participation figures (UIS, 2004).

<sup>27</sup> See for example, UIS (2004). An alternative explanation is that administrative data do not over count the total number of pupils enrolled in school, but are biased to report pupils as having ages that fall within the official primary age range when they are actually older or younger than the primary age range. See pages 66-67 of UIS and UNICEF (2005).

Most recent household surveys measure participation as attendance *at any time* during the preceding school year—a fairly generous approach that is not substantively dissimilar to formal enrollment. Holding constant other reasons that survey and administrative data may differ (such as attendance in non-formal schools), one would expect enrollment to exceed attendance because once a child has enrolled it is valid for the year, whereas school attendance can be reported for a point in time throughout the course of the year after enrollment data have been captured. This is true in most countries, with a few exceptions (see Chapter 3 for Kenya example). Survey data analyses must also account for situations where a child was of school age *at the time of data collection* but had not been of school age *at the beginning of the school year*, and hence, reported as having not attended school. Chapter 3 of this report provides a more in-depth analysis of this issue.

### Defining the target population

Beyond the distinctions between enrollment and attendance, estimates of school participation from administrative and household survey sources may vary due to the differences in defining the target population from which the estimates are drawn. Household survey may exclude or fail to fully represent populations that do not reside in traditional households, including nomads, street children, boat people, migrant workers, refugees, and those living in institutional residences, such as orphanages or hospitals. These groups are generally quite small as a proportion of the overall population, but they may have different attendance rates than the national norm. Street children, for example, may be more likely to never attend school, or to drop out. Children in institutions, on the other hand, may have better school access and higher attendance rates than the rest of the population (UIS, 2010).

Surveys may also deliberately exclude populations living in regions of countries where conflict or environmental disasters restrict access. This is the situation with the 2006-07 Pakistan DHS, which

was not able to survey the Federally Administered Tribal Areas, Federally Administered Northern Areas, and Azad Jammu and Kashmir areas that account for roughly six percent of the national population (NIPS & Macro International, 2008). Consequently, information about school participation for these regions is unknown. Given the security and political stability concerns that led the regions to be excluded from the data collection effort, it would be unsurprising if out of school rates there were higher than the national average—and consequently, would pull up the true national average rates of school exclusion. Surveys are also not immune to sampling error, particularly where uncertainty exists about the size, structure and heterogeneity of the underlying population—however, the large sample sizes drawn by major surveys such as DHS and MICS reduce the probability of sampling error to negligible levels. While generally a single survey is available for a given year in a country, a rough comparison of rates from different surveys for the same country carried out by UIS (2005) indicated that survey-based statistics generally reinforce each other. A different challenge arises with administrative figures. Because they are school-based measures of educational participation, it is important to consider what counts as a school. UIS explicitly limits the definition of ‘in school’ for primary age children to participation in formal primary or secondary school (UIS, 2005)<sup>28</sup>. However, children of primary school age who are participating in preschool, as well as those participating in unstructured, unregistered private or community-run non-formal education programs, are treated as out of school<sup>29</sup>. Many non-formal programs are not registered as schools, even if they teach the national curriculum (Thompson, 2001). Household surveys have the advantage of being able to capture these

<sup>28</sup> UIS (2005) states that “those in non-formal education are typically counted as out of school, except when it is recognized as fully equivalent to formal primary education” (p.13). This approach is reaffirmed in the Methodology chapter of the UIS e-Atlas (<http://www.app.collinsindicate.com/uis-atlas-out-of-school-children/en-us>), accessed in May 2013.

<sup>29</sup> An exception is non-formal programs that are recognized as fully equivalent to formal education programs. See section 1.2 of UIS and UNICEF (2005).

different educational domains. When household heads are asked whether a child attended school, the type of school is most cases not specified. This may help explain in part why certain countries, like Kenya, have higher out of school rates according to administrative sources than they do according to survey sources (see Chapter 3). It seems evident that subsequent household surveys would benefit from requesting greater detail on the types of schools attended by the children.

Finally, both administrative and survey sources are impacted by measures of population. Administrative and survey sources used by UIS and EPDC refer to the United Nations Population Division (UNPD) for population estimates (UIS, 2005). Sudden changes in population figures have an impact on estimates of out of school children. In the case of Iran, where fertility rates have been declining since the 1980s (World Bank, 2010), there have been steady drops in the population. As presented in Figure 2.6, the primary-aged population (ages 5 to 10) dropped by 400,000 children each year from 2001 through 2005, with an overall drop from 7.9 million children in 2000 to 5.3 million in 2011 (UNPD). In a time

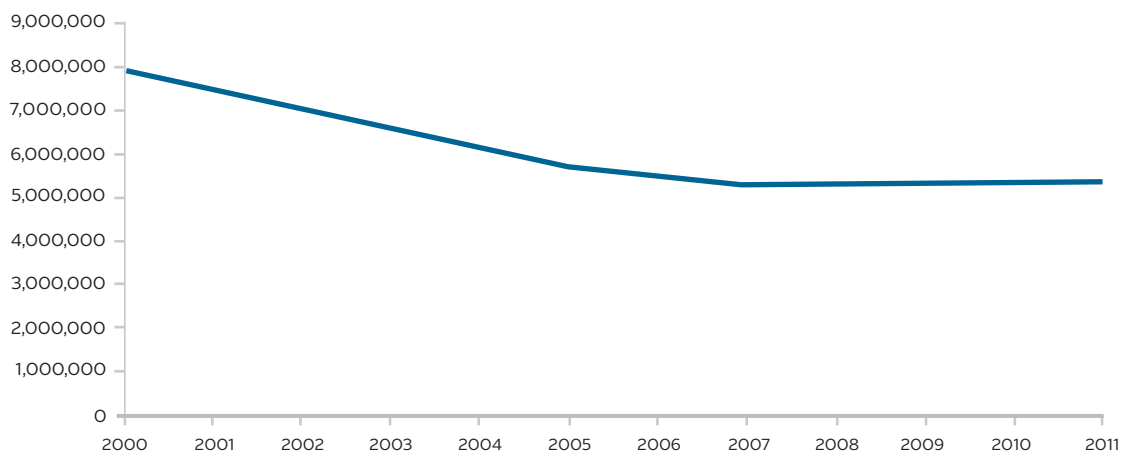
series view (Figure 2.7), the precipitous decline in numbers of out of school children (from an estimated 447,000 in 2002 to 47,000 in 2006) occurs partly as a result of solid improvements in out of school rates (which ranged from a high of 14% in 2000 to a “nil or negligible” value in 2011 according to UIS), but also significantly due to the shrinking school-aged population. This is yet another reason to bear rates as well as volumes in mind when evaluating change over time.

### Timeliness of data

The availability and timeliness of data affects the reliability of estimates of out of school children. This chapter examines sub-Saharan Africa and South Asia, using countries that have survey data from 2006 and later and excluding the 19 countries that do not meet this criteria<sup>30</sup>. For the 40 countries selected, out of school rates in the UIS database were more than a decade old for the Democratic Republic of the Congo, Sierra Leone, Somalia, pre-secession Sudan

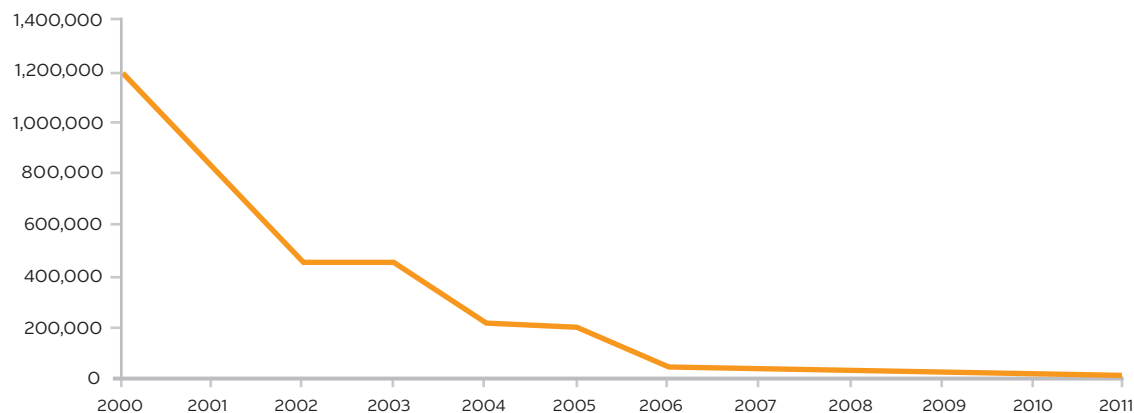
<sup>30</sup> Sub-Saharan Africa: Angola, Botswana, Cape Verde, Chad, Comoros, The Republic of the Congo, Equatorial Guinea, Eritrea, Gabon, Guinea, Guinea-Bissau, Mauritius, Reunion, Sao Tome and Principe, Seychelles, Western Sahara. South Asia: Afghanistan, Maldives, and Sri Lanka.

**FIGURE 2.6: PRIMARY-SCHOOL AGE POPULATION IN IRAN.**



Note: Please note that this chart uses a different scale than Figure 2.7.  
Source: UN Population Division

**FIGURE 2.7: NUMBER OF OUT OF SCHOOL CHILDREN OF PRIMARY AGE IN IRAN**



Source: UIS Data Centre

(no estimates are currently available for South Sudan or post-secession Sudan), Zimbabwe, Bangladesh, and Nepal. Of these, the most recent estimates for Sierra Leone, Somalia, and Zimbabwe are from the 1980's. Still, UIS data are more current than the available survey data for 27 of the 40 countries considered in this section.

Having current data is important. This applies both to the numerator (# out of school) and the denominator (# of children of primary school age) when calculating rates. Population data are rarely collected more frequently than every 10 years, with population levels between censuses imputed using demographic estimation methods (such as the Sprague interpolation) and population projections based on historical trends. For school participation statistics in most countries, out of school figures tend to improve over time and older figures are likely to overestimate the extent of the problem. In situations where trends are stable, projections can supply estimates for school participation if data are unavailable. However, this is more complicated in situations where population or school participation trends are upset by emergencies (e.g., natural disasters, famines, HIV/AIDS pandemics, or violent

conflicts). Methodologies are not currently available to build accurate projections for these contexts. Conflicts and natural disasters are likely to impede school participation, so it is important to have reliable estimation methods, especially given the challenges of data collection in such situations.

Indeed, the most current published administrative or household survey data predate conflict or crisis in approximately a third of the 40 countries considered in this exercise<sup>31</sup>. This presents an obstacle to accurate measures of school participation. In Somalia, where the most current data come from a 2006 Multiple Indicator Cluster Survey, violence has been ongoing for two decades, producing an estimated 1.1 million refugees and 1.4 million internally displaced persons (UNHCR, 2012). The conflict has involved sexual and gender based violence, attacks on schools, recruitment of child soldiers, and forced early marriage (Human Rights Watch, 2012). Of the countries examined in this chapter, Somalia has the highest primary-level out of school rate (78.9% by the ISCED definition of primary school and 76.9% by

<sup>31</sup> Information about conflict and emergency status comes from the Uppsala Conflict Data Program, the Internal Displacement Monitoring Centre, and Relief Web.



the national definition). It has been more than half a decade since the last survey, and school participation is likely to still be low. However, insufficient data make it difficult to ascertain the scope of the problem and anticipate the resources required to address it.

## Inequalities among subpopulations

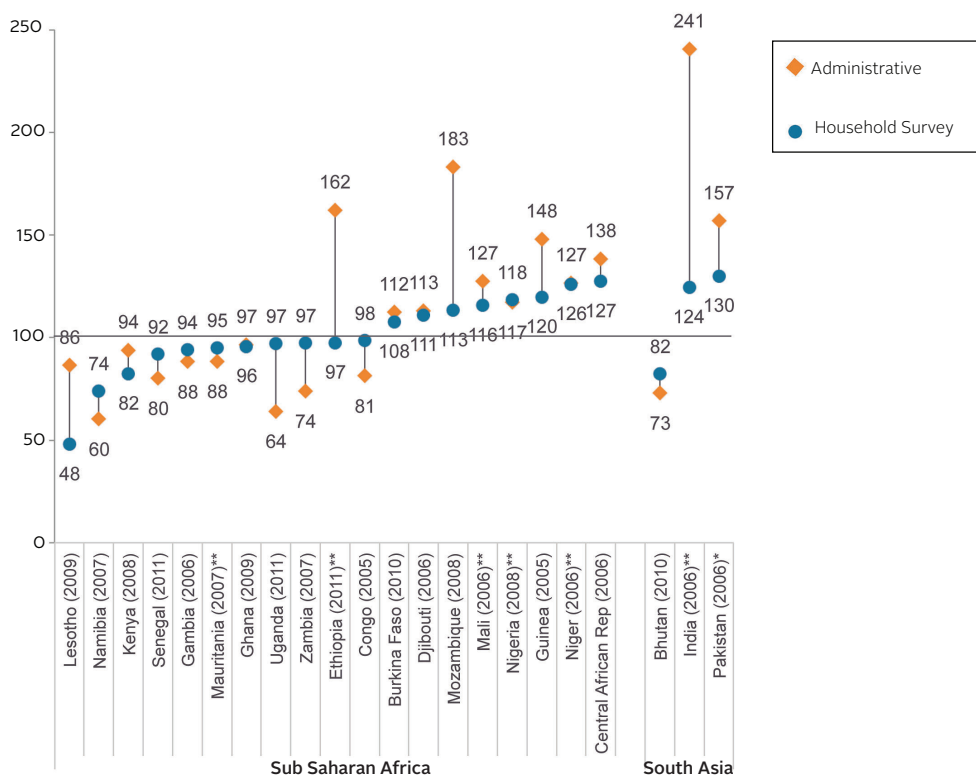
National estimates are essential in defining the scope of the out of school crisis. Yet the summary they offer often obscures disadvantages that are disproportionately borne by subpopulations. We consider out of school rates by subnational units and select characteristics: sex, locality (urban or rural),

and relative wealth (by wealth quintiles) in order to provide greater clarity on which children are out of school. This information can then inform data-driven interventions that target populations for whom school participation is most endangered.

It is notable that different data sources sometimes tell different stories about the extent of inequality. Figure 2.8 compares the gender disparity presented in data from UIS and household survey sources for the 22 countries with same-year estimates available. While for many countries estimates of gender disparity are similar between sources, the differences are substantial for Lesotho, Uganda, Ethiopia, Mozambique, and India. For example, in Ethiopia, the extent of disparity varies by source: administrative figures paint a stronger image of

**FIGURE 2.8: COMPARISON OF GENDER DISPARITY BY DATA SOURCES.**

Chart shows the number of girls out of school for every 100 boys out of school.



Note: The chart presents parity indices for out of school rates (female values divided by male) for primary age children (using ISCED definition of primary) derived from household survey and UIS administrative data. Values smaller than 100 indicate greater disparity to boys. Where a country is marked with \*\*, UIS has indicated that values are UIS estimates. Where a country is marked with \*, UIS has indicated that values are national estimates. Sources: Administrative estimates are derived from data in the UIS Data Centre; household survey estimates are from DHS except for Central African Republic, Djibouti, Gambia, Mozambique, Bhutan, Guinea, and The Republic of Congo, which are from MICS.

female disadvantage, showing that for every 100 boys out of school there are approximately 160 girls out of school. Moreover, the direction of disparity varies by source for Ethiopia: where UIS figures show female disadvantage, surveys show a very slight disadvantage to males, though within the range generally considered parity (97 to 102 girls out of school for every 100 boys out of school). Lloyd and Hewett (2003) make the claim that in Sub-Saharan Africa, administrative enrollment figures exaggerate gender inequality as compared to survey-based attendance rates. The authors caution that a bias towards greater gender disparity in administrative figures distracts from other sources of disparity; however, more research is required to examine whether this is the case. At the very least, the magnitude of disparity may vary by source and it is important to bear this in mind when using school participation figures.

#### **Examining disparities among subpopulations**

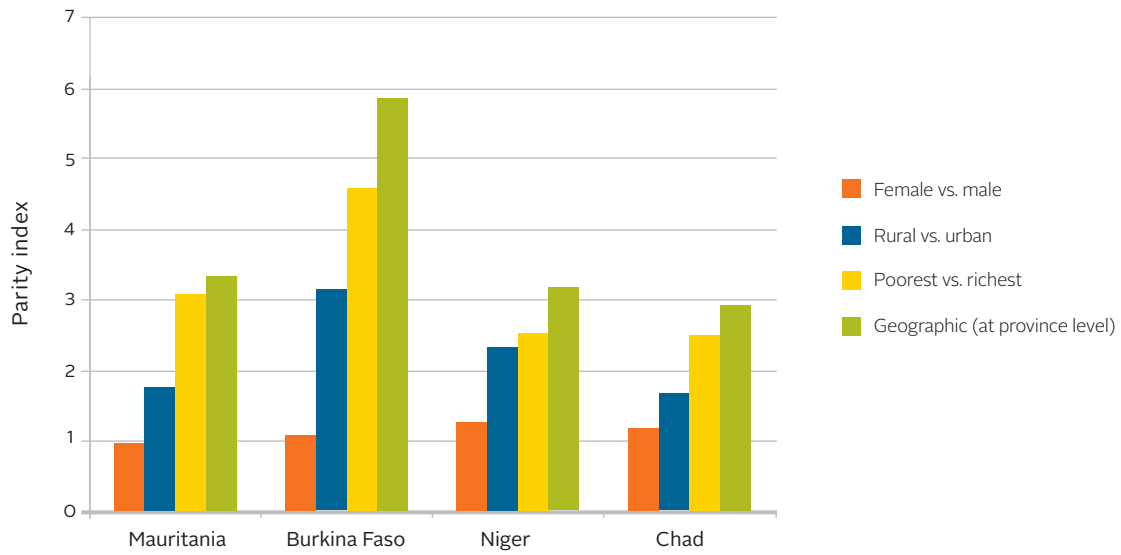
Household surveys allow us to examine gender disparities alongside wealth, locality, and regional differences in order to consider which children are out of school and specifically where they are (UIS, 2004). Figure 2.9 compares the extent of school exclusion by subnational units and individual characteristics. In these countries, disparity is greatest between those living in the subnational regions with the best and worst out of school rates and between richest and poorest quintiles. Pronounced disparities are particularly evident in Burkina Faso, where there are 5.8 children out of school from the worst performing province for every 1 child from the best performing province, and

4.6 from the poorest quintile for every 1 from the wealthiest quintile. This serves as another indication that national estimates must be understood in relation to more nuanced dynamics observed among different subpopulations.

Subnational details bolster an understanding of school participation within countries, but they also contribute to an understanding of trends across regions, particularly ones that national borders can mask. Such patterns may provide insight into obstacles to school participation including: (1) violent conflicts that spill across national borders and/or create regional refugee situations, such as those originating from conflicts in Sudan or Myanmar; (2) ecological or environmental patterns that impact school going, such as difficult terrain in mountainous or desert settings; or (3) ethnic or cultural influences on schooling, such as attitudes towards schooling, nomadic practices, or linguistic issues that play a role in access to and decisions about schooling.

The general sources of variation discussed in this chapter - competing definitions of primary education, different education sources, timeliness of data, and inequalities among subpopulations - are important to understanding what contributes to out of school estimates, and consequently, to designing smart and targeted interventions. The next chapter illustrates the impact of these discrepancies on the estimates of out of school children in two countries, and provides greater insight into the nuances of this policy challenge.

**FIGURE 2.9: SUBNATIONAL DISPARITY IN OUT OF SCHOOL RATES FOR PRIMARY AGE CHILDREN (ISCED 1) IN FOUR COUNTRIES IN SUB-SAHARAN AFRICA**



Note: Parity index is calculated as the magnitude of the difference in out of school rate by subgroup with a value of one representing perfect parity.

Sources: EPDC extraction of DHS dataset with the exception of MICS for Mauritania

## CHAPTER 3.

# Country Case Studies

As Chapter 2 illustrates, estimates of out of school children can vary depending on how one chooses to define such seemingly simple concepts as primary school duration, what qualifies as in-school, and attendance versus enrollment. Each of these concepts can be operationalized in different ways that may all be valid depending on the perspective and the priorities of the entity performing the calculations.

In addition to these somewhat subjective decision areas, technical matters such as how children's ages are measured, and whether measures are obtained using a school-based or household-based data collection instrument, can also influence the overall estimate.

How much difference does it make if school age is defined using one classification scheme and not another, or if children enrolled in preschool are counted as "in school" rather than out? Through case studies looking at the measurement of out of school children in Kenya and India, this section illustrates the degree to which global and national estimates of the

number of out of school children can be sensitive to factors such as:

- Differences between school-based and household-based data collection instruments.
- Differences in the range of ages associated with primary school.
- Whether or not attending preschool, unregistered private primary schools, and other primary school alternatives qualify as being "in school." The treatment of children's ages (as school-age or not), as collected through household surveys.

**TABLE 3.1: ALTERNATIVE MEASURES OF OUT OF SCHOOLCHILDREN OF PRIMARY SCHOOL AGE IN KENYA.**

School Participation figures. Kenya, 2008.	Enrollment (derived from UIS administrative data)		Attendance (derived from DHS household survey data)	
	Enrolled	Not Enrolled	Attending	Not Attending
Ages 6-11. In school includes Primary and Secondary.	5,070,000	1,051,000	5,300,000	821,000
	83%	17%	87%	13%
Ages 6-11. In school includes Preschool, Primary and Secondary.	5,813,000	309,000	5,787,000	334,000
	95%	5%	95%	5%
Ages 6-13. In school includes Primary and Secondary.	6,873,000	1,060,000	7,030,000	904,000
	87%	13%	89%	11%
Ages 6-13. In school includes Preschool, Primary and Secondary.	7,616,000	317,000	7,518,000	415,000
	96%	4%	95%	5%

## Kenya

The case of Kenya is illustrative of many of the data issues outlined in this report. A comparison of data from an administrative source and household survey data for Kenya yields unexpected results, with survey data suggesting school attendance rates in excess of enrollment rates. This section explores factors that contribute to the complexity of out of school measurement in Kenya, and draws attention to the importance of clarity and consistency of measurement methodology.

### Competing definitions of primary school

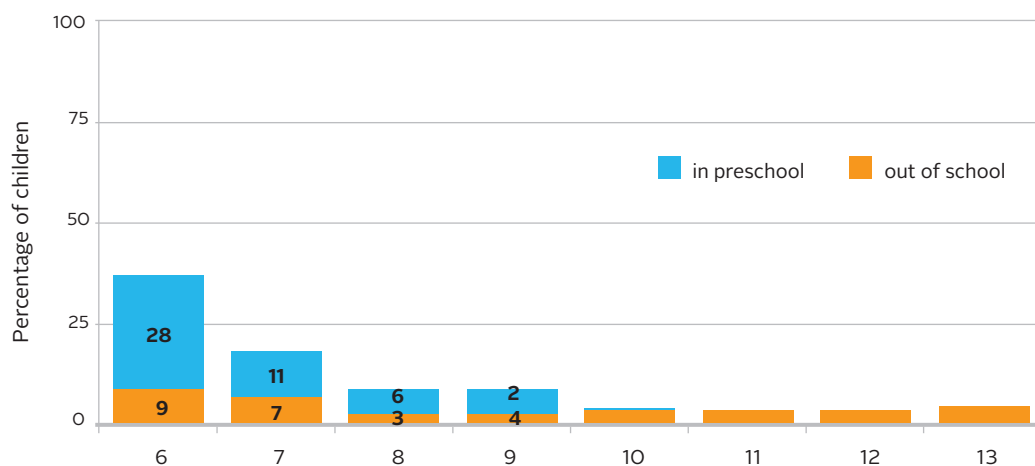
As discussed in Chapter 2, competing definitions of primary education can lead to substantial variation in estimates of out of school children within countries, and internationally accepted definitions of primary are often shorter in duration than national definitions. Primary school in Kenya consists of eight standards, officially corresponding to ages 6-13. The UNESCO Institute for Statistics (UIS) however, treats only the first six standards of primary school (ages 6-11) as corresponding to ISCED level 1, which UIS uses as the basis for its primary-level calculations. Although the rationale for ISCED is that this method preserves comparability across countries, most of which have 6

grades of primary (UIS, 2008a), the result for Kenya is that UIS data are not fully reflective of the primary education experience there. As shown in Table 3.1, treating only standards 1-6 as primary school drives the out of school rate from 11% up to 13%, because 7th and 8th graders are not considered. It also brings down the overall number of out of school children of primary age because it excludes 12-13 year olds.

### Preschool enrollment

Defining in-school as enrollment in either primary or secondary school also has implications. UIS explicitly treats primary school-aged children who are participating in preschool programs as out of school, regardless of whether the program is offered in a formal or non-formal setting (UIS & UNICEF, 2005). In countries such as Kenya, where participation in preschool programs is high, this component of the definition of out of school has a large effect on the overall measure of out of school children. Figure 3.1 distinguishes between children who are classified as out of school because they are attending preschool and those who are not participating in any school. The proportion of children who are attending preschool, especially those between the ages of six and eight, is striking. Of the 37% of six year-olds who are counted as out of school, more than two-thirds

**FIGURE 3.1: % CHILDREN OUT OF SCHOOL AND ATTENDING PRESCHOOL. AGES ADJUSTED. KENYA.**



Source: EPDC extraction of DHS dataset.

are actually attending preschool, based on household survey data for 2009.

There are valid reasons for counting children of primary school age in preschool as out of school—it would be a mistake, for example, to assume that nine-year-olds attending preschool are receiving an age-appropriate education. At the same time, a young six-year-old who is kept in preschool for an additional year before entering first grade is less troubling, from a policy perspective, than a child who has never attended school or has dropped out. If children attending preschool were to be counted as in-school rather than out-of-school, Kenya's out of school rate would decline to 5.5% for 6-11 year-olds and 5.2% for 6-13 year-olds (DHS, 2009).

### **Unregistered private schools**

Enrollment in unregistered private schools may also contribute to gaps between administrative and household survey-based estimates. Unlike administrative data, which uses instruments that will not count pupils unless they are officially recognized as private providers, household surveys can be expected to be neutral to the distinction between formal and non-formal schooling. Most surveys ask questions such as “Is *NAME* currently attending school?” or “Did *NAME* attend school at any time during the 2010-2011 school year?” leaving it up to the respondent to decide what counts as “school.” Assuming respondents see unregistered non-formal schools as basically equivalent to formally recognized schools, it is likely that household surveys such as the 2009 Kenya Demographic and Health Survey measure attendance in both formal and non-formal schools. Research published by the African Population Health and Research Center (APHRC) provides some insight into the rate at which school children are enrolled in formal and unregistered non-formal schools. Drawing from a 2005 survey of households in two urban slum neighborhoods and two urban non-slum neighborhoods of Nairobi, APHRC shows that among enrolled 5-19 year-olds, 39% of those in the slum neighborhoods

and 19% in the non-slum neighborhoods were enrolled in “private schools” (Oketch et al., 2008a). Approximately half of the schools observed by APHRC were run by private entrepreneurs, with the rest run by religious or community organizations. The majority of these private schools were not registered with the Ministry of Education, though they did follow the recommended ministry curriculum and register their pupils to sit for national examinations (Oketch et al., 2008b).

Although these findings cannot be generalized to the rest of Kenya, they do suggest that, at least in parts of Nairobi, enrollment gathered through administrative sources may miss significant numbers of children who are enrolled in non-formal unregistered private schools. Because we would expect parents interviewed in a household survey to respond that their child is attending school whether or not it is registered with the Ministry of Education, the survey-based count would indicate a lower proportion of children out of school than the administrative data-based count. Currently, however, it is not possible to quantify the extent to which this difference accounts for the discrepancies between administrative and survey measures of out of school children in Kenya.

### **Age measurement for the reference school year**

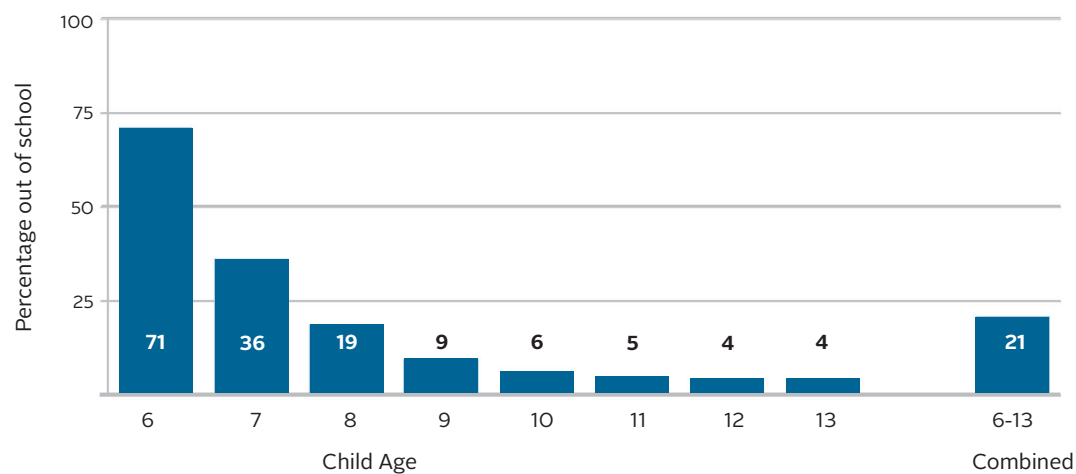
Effective use of survey data requires attention to the structure of the dataset and an understanding of the context in which the data collection took place. A closer look at the 2009 Kenya Demographic and Health Survey (DHS) illustrates how important this is - in particular, adjusting children's ages to correct for the timing of the survey relative to the beginning of the school year is essential for obtaining accurate figures.

Enumeration for the 2009 Kenya DHS began in November 2008 and concluded in March 2009. Because Kenya uses a January-December academic calendar, school attendance data were collected during last two months of the 2008 school year and

the first three months of the 2009 school year. In order to ensure the consistency of survey responses, the household survey questionnaire is written to specifically reference the 2008 school year in the question that is used to determine children's school attendance status: "Did [NAME] attend school at any time during the 2008 school year?" Thus, regardless of whether interviews are conducted during the

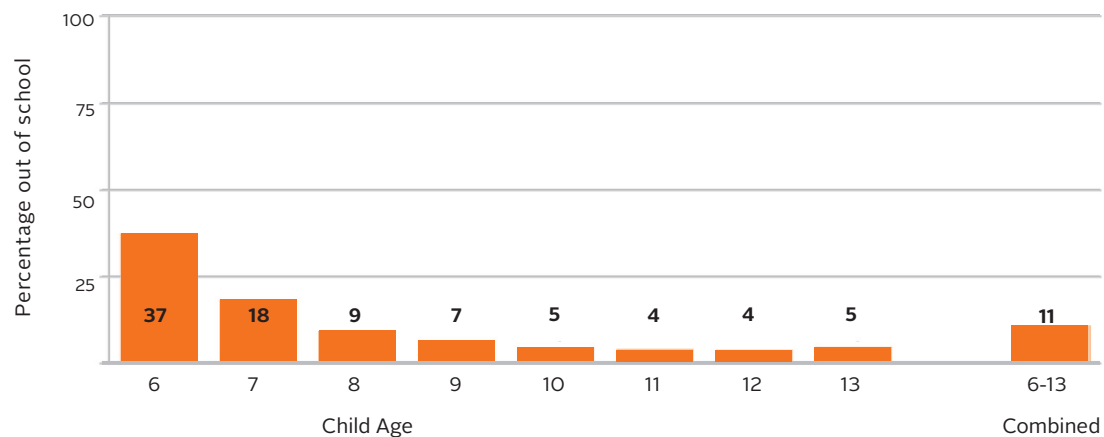
2008 school year, the 2009 school year, or the inter-session break, all responses to the school attendance question describe attendance during the 2008 school year. Assuming that survey respondents understand the question properly, it is clear that measures of school participation based on this survey pertain to the 2008 school year, despite the fact that the overall survey is labeled 2009.

**FIGURE 3.2: % CHILDREN OUT OF SCHOOL BY SINGLE YEAR AGE GROUP, KENYA (AGES NOT ADJUSTED)**



Note: Ages not adjusted to reflect the lag between the beginning of the school year and survey enumeration.  
Source: EPDC extraction of DHS dataset.

**FIGURE 3.3: % CHILDREN OUT OF SCHOOL BY SINGLE YEAR AGE GROUP, KENYA (AGES ADJUSTED)**



Note: Ages adjusted.  
Source: EPDC extraction of DHS dataset.

The extended length of time over which surveys are conducted may lead to inconsistencies in age data, which in turn affects the precision of non-attendance measures for a given age group. Therefore, it is crucial that measures of school participation be calculated using children's ages at the beginning of the school year. This is especially true in the case of the 2009 Kenya DHS because, as a result of children's ages having been collected 11-15 months after the beginning of the 2008 school year, it is reasonable to assume that nearly every child has had at least one birthday since that reference point, and some will have had two birthdays. As a result of this 11-15 month lag, many children who were six years old (official primary entry age) when their age was reported in the survey, were only five or four years old in January 2008.

Figure 3.2 illustrates the distortive effect on out of school rate of failing to adjust ages with reference to the beginning of the school year. This figure, which corresponds closely to Figure 2.2 in the 2009 Kenya DHS final report (KNBS & ICF Macro, 2010), suggests that 21% of primary-aged children are out of school. It is clear that out of school children are overwhelmingly 6-7 years old, children who were most likely too young to enter school in January 2008. When an adjustment is made to reflect actual ages at the beginning of the 2008 school year (Figures 3.2 and 3.3), the percentage of primary aged children who are out of school declines dramatically, from 21% to 11%.

### Lessons from the Kenya case

As we demonstrated above, there exists a substantive discrepancy in the national-level estimate of out of school children between household survey and administrative sources. Administrative figures from the UIS database indicate that 17% of children aged 6-11 were out of school during the 2008 school year. Data from the 2009 Kenya DHS, when adjusted to match UIS methodology as closely as possible, suggest that the out of school rate for children in this age group is 13%. While it is not unusual to have a gap

of several percentage points between measures from two different types of data sources, what is unusual is that the household-based attendance figure suggests a lower proportion of out of school children than the administrative-based enrollment figure. Although sufficient data are not available to say so conclusively, it is possible that this difference is explained in part by high rates of participation in non-formal unregistered schools—a phenomenon which, we hypothesize, household survey instruments would be sensitive to, but school census data would not. It could also be argued that sampling error, response bias, or other problems related to survey data collection may explain this unexpected result; however, the same pattern can be seen in the 2003 Kenya DHS, which yields a 21% out of school rate for 6-11 year-olds in comparison with 25% according to UIS. A more concerted research effort examining the share of the primary enrollment taken up by non-formal schools in Kenya would be a worthwhile endeavor in seeking out the reconciliation of survey-based and administrative estimates.

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## India

India, with a population of 123 million 6-10 year-olds in 2006<sup>32</sup>, is home to 19% of the global population of primary school aged children (ISCED definition of primary, UIS data). With such large numbers, even small changes in the estimated percentage of out of school children can have a dramatic effect on the global count. Even as UIS estimates that non-enrollment had fallen as low as 5% in 2006<sup>33</sup>, household survey data for 2006 indicates a rate closer to 17% (Table 3.2). The gap between these percentages amounts to nearly 15 million primary-aged children—an enormous figure, given that the entire UIS global total of out of school children in

<sup>32</sup> The reference year for comparisons across sources in this chapter is 2006, which is the latest school year for which a household survey is available.

<sup>33</sup> Administrative estimate of the out-of-school rate for 2008 fell even further, to 2% of primary school aged children (UIS database accessed in March 2013).



**TABLE 3.2: ALTERNATIVE MEASURES OF OUT OF SCHOOL CHILDREN OF PRIMARY SCHOOL AGE IN INDIA.**

School Participation figures. India, 2006.	Enrollment (derived from UIS administrative data)		Attendance (derived from DHS household survey data)	
	Enrolled	Not Enrolled	Attending	Not Attending
Ages 6-10. In school includes Primary and Secondary.	117,014,000	6,315,000	102,381,000	20,948,000
	95%	5%	83%	17%
Ages 6-13. In school includes Primary and Secondary.	N/A	N/A	159,469,000	36,860,000
	N/A	N/A	81%	19%

**TABLE 3.3: PERCENTAGE OF CHILDREN AGES 6-10 WHO ARE OUT OF SCHOOL.**

	% Not Attending	% Not Enrolled
2001	31%	17%
2006	17%	-
2008	12%	4%
2010	-	2%

Sources: Population Census (2001), NFHS Survey (2006), NSSO Survey (2008); these figures are available in the Millennium Development Goals India Country Report (2011, p. 41)

2006 ran at 717 million. In part, this discrepancy may be explained by the difference between enrollment and actual attendance: all things being equal, we generally expect attendance rates to yield higher estimates of exclusion, since it is possible for a child to enroll and not attend school.

### Enrolled, but not attending

As we noted in Chapter 2, household surveys measure attendance at any point during a specified school year, and consequently, a child is not considered “out of school” if he or she attended school at least once over that period. While it is still a liberal measure of school participation, one would expect attendance rates to be slightly lower than enrollment rates, since children may be officially enrolled but not attend school (although the Kenya case suggests a different dynamic, possibly related to

the prevalence of non-formal private schools). In the case of India, however, the difference is substantially larger than the norm: using an age-adjusted non-attendance rate for children of ages 6-10, which correspond to primary school according to ISCED 1997 classification, we arrive at an out of school rate of 17% (NFHS, 2007<sup>34</sup>), as compared with a rate of 5% based on administrative sources reporting to UIS.

The 17% NFHS-based out of school rate is not out of alignment with the findings of other surveys and censuses carried out in India. In a 2011 report, the Ministry of Statistics and Programmed Implementation acknowledges the large, albeit decreasing gap between administrative instruments and survey- and census-based out of school rates. Far from questioning the validity of the household-based measurements, the Ministry sees the gap as an impetus for a concerted effort to improve school attendance. Non-attendance rates from the survey and census sources, as well as comparable national non-enrollment rates for the same period, are reproduced in Table 3.3.

### Competing definitions of primary

The typology of school levels in India is complex and varies across states and union territories within the country. Broadly speaking, the primary-secondary component of the school system is sub-divided

<sup>34</sup> The National Family Health Survey (NFHS) is carried out by Macro International under the auspices of the Ministry of Health and Family Welfare, and follows the methodology, format and structure of the Demographic Health Surveys.

**TABLE 3.4: % PRIMARY AGED CHILDREN NOT ATTENDING SCHOOL, USING STATE-LEVEL DEFINITIONS OF THE PRIMARY AGE RANGE.**

State or U/T	Primary Entry Age	Primary Duration	Primary Age Range	% OOS Local Ages	% OOS Ages 6-10
Goa	5	4	5-8	15%	4%
Gujarat	5	4	5-8	14%	9%
Karnataka	5	4	5-8	19%	10%
Kerala	5	4	5-8	7%	1%
Maharashtra	5	4	5-8	18%	9%
West Bengal	5	4	5-8	26%	16%
Andhra Pradesh	5	5	5-9	19%	12%
Delhi	5	5	5-9	19%	11%
Himachal Pradesh	5	5	5-9	5%	2%
Jammu And Kashmir	5	5	5-9	20%	11%
Manipur	5	5	5-9	28%	17%
Orissa	5	5	5-9	15%	14%
Punjab	5	5	5-9	20%	12%
Sikkim	5	5	5-9	33%	20%
Tamil Nadu	5	5	5-9	3%	2%
Uttar Pradesh	5	5	5-9	28%	20%
Uttaranchal (1)	5	5	5-9	9%	6%
Assam	6	4	6-9	9%	10%
Meghalaya	6	4	6-9	45%	41%
Mizoram	6	4	6-9	8%	7%
Nagaland	6	4	6-9	30%	26%
Arunachal Pradesh	6	4	6-9	29%	29%
Bihar	6	5	6-10	40%	40%
Chhattisgarh (2)	6	5	6-10	15%	15%
Haryana	6	5	6-10	12%	12%
Jharkhand (3)	6	5	6-10	27%	27%
Madhya Pradesh	6	5	6-10	19%	19%
Rajasthan	6	5	6-10	20%	20%
Tripura	6	5	6-10	9%	9%
Aggregate				22%	17%

(1) Not listed, so assumed to have the same structure as neighboring Uttar Pradesh.  
(2) Not listed, so assumed to have the same structure as Madhya Pradesh, of which it was formed in 2000.  
(3) Not listed, so assumed to have the same structure as Bihar, of which it was formed in 2000.

into four segments—primary, upper primary, secondary, and senior secondary. However, the age range associated with these levels varies by state. According to the International Bureau of Education *World Data on Education* report for India (UNESCO IBE, 2011), the official entry age for primary is five in 21 states and six in the remaining eleven states. Nineteen states define primary education as consisting of the first five standards of school whereas thirteen define primary as consisting of the first four standards. The result is that states may have any one of four official primary age ranges: 5-8, 5-9, 6-9, and 6-10. A list of the state defined age ranges for primary school is given in Table 3.4.

At the national and international levels, state-level variation is smoothed over in order to allow for the calculation of more standardized indicators. Reports published by the Ministry of Human Resources Development in India avoid reference to the terms “primary school” and “upper primary school” altogether, instead publishing school participation rates for defined age ranges (typically ages 6-10, 11-13 and 6-13). UIS, following ISCED, simply defines primary school for the country as a whole as the first five standards of formal school and treats standards 6+ as secondary school. Because school attendance in India does not peak until age 10, and because most state-defined primary age ranges are younger than the 6-10 used by MHRD and UIS, the state defined age ranges yield a higher primary non-attendance rate of 22% as compared with the ages 6-10 non-attendance rate of 17%. Table 3.4 presents non-attendance rates by state using both the state-defined age ranges for primary school, and the national age range of 6-10.

### **Preschool and non-formal enrollment**

The 2005-06 India NFHS gathered information on children attending primary school, secondary school, and college, but did not ask about children attending school at a pre-primary level. While this is sufficient to allow for calculating the formal measure of out of school children, it is not possible to estimate whether primary aged children who are not yet in primary are participating in programs that lay the groundwork for

primary education. Although it is difficult to ascertain the extent to which primary-aged children in India are participating in preschool activities, crude measures<sup>35</sup> suggest that the phenomena is not as pervasive as it was shown to be in Kenya. Indeed, the NFHS data show that, rather than enroll in programs such as preschool, as many as 52% of 5-year olds and 24% of 4-year olds attend primary school.

Similarly, non-formal unregistered schools do not seem to be a substantive factor in the discrepancies between administrative and survey counts of out of school children. As was the case with Kenya, it is likely that some primary aged children in India attend non-formal schools that do not report enrollment figures to the government. Although nationally representative data on non-formal schools in India are not available, research conducted in a selection of slum areas of Hyderabad suggest that non-formal schools may account for 23% of enrollment in these neighborhoods (Tooley & Dixon, 2005). While these findings cannot be taken as representative of the country as a whole, they do indicate that a non-negligible proportion of children might be counted as in-school by the household survey that may not be counted in administrative sources. To the extent that this is the case, the survey data would be expected to represent lower proportions of the school-aged population as being out of school when compared with data from administrative sources. The fact that this is not true in India indicates that non-formal schools are either included in the national enrollment measures, or their presence does not have a substantial effect on overall school participation.

### **Age adjustment for the reference school year**

Data collection for the 2005-2006 India NFHS took place over an extended period of time, beginning in December 2005 and concluding nine months later in August of 2006. This means that, according to data

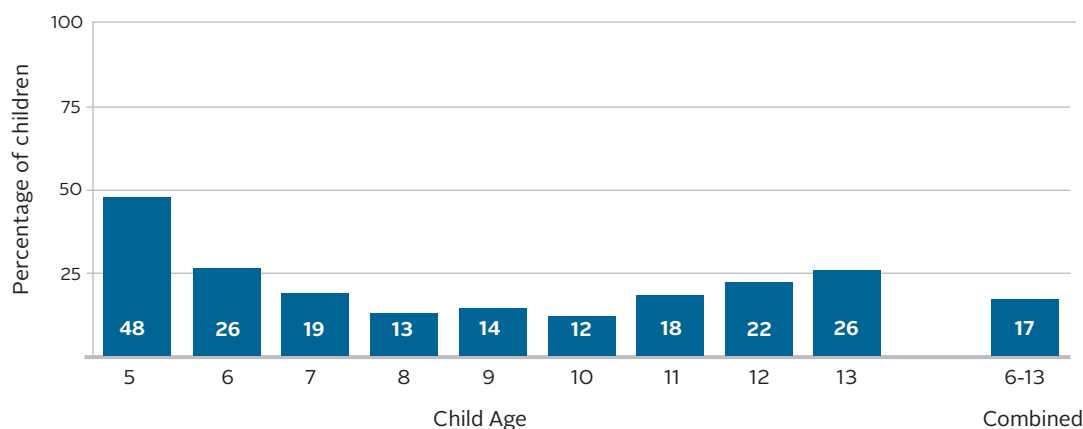
<sup>35</sup> Data from a Socio-Economic Survey that was conducted July, 2004-June, 2005 suggest that less than 3% of children between the ages of 6 and 10 were attending preschool. Because school participation questions from this survey do not reference a fixed school year and because it was not possible to adjust children's ages to a fixed date, this figure may not be accurate.

published in the UIS database, enumeration spanned the 2005-2006 (April-March) and the 2006-2007 (April-March) school years. Children's school participation status is calculated based on responses to the question "Did [NAME] attend school or college at any time during the 2005–2006 school year?", so we assume that, so long as the school attendance question is properly understood, all responses are with reference to the 2005-2006 school year, even when interviews were conducted well into the 2006-2007 school year. Because children's ages were collected between nine and seventeen months later than this date, most children would have had one or two birthdays in the meantime. Without adjusting downwards to account for this elapsed time, it is possible to mistakenly identify as "primary aged" a 6-year old who was actually only four years old in April 2005. As in Kenya, the age adjustment has a large effect on the primary-age out of school rate, particularly among children closer to school entry age. In the case of India, adjusting ages reduces the age 6-10 non-attendance rate by seven percentage points, from 24% to 17%. Figure 3.4 displays the non-attendance rate by adjusted single-year ages for the 2005-2006 India NFHS.

### Lessons from the India case

In sum, the gap between estimates of both the rate and the number of out of school children in India for 2006 based on household survey and administrative data is large. The magnitude of the gap is made all the more apparent by the outsized effect of India on the global count of out of school children. A portion of the gap may be explained by the differences in the definition of the target population, measurement errors or biases inherent in household survey and administrative data collection tools, or the conceptual difference between attendance and enrollment (i.e. a portion of the children whose names appear on school rolls may not be attending school at all, not even for a single day in a year). Multiple factors are at play, and for a country as complex and decentralized as India, more research is necessary both to ascertain the causes in divergent estimates and set clear benchmarks to track progress in improving access to primary school for all children.

**FIGURE 3.4: % CHILDREN NOT ATTENDING SCHOOL BY SINGLE YEAR AGE GROUP, INDIA.**



Note: Ages adjusted to reflect age at the beginning of the school year.  
Source: EPDC extraction of DHS dataset.

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## Reconciling estimates of out of school children for Kenya and India

The cases of Kenya and India are illustrative of the range of estimates of primary aged out of school children that can be obtained using the same data. In Kenya, this number could range from as low as 309,000 to as high as 1,050,000, depending on how primary school is defined and whether children in preschool qualify as “in school”<sup>36</sup> (see Table 3.1). Further, the presence of non-formal unregistered schools serving the needs of urban populations may account for at least a portion of the gap between administrative and household survey-based estimates. Definitional differences aside, however, the discrepancy in out of school rates resulting from household- and school-based data sources in Kenya was relatively small. In the case of India, on the other hand, administrative and survey data sources produce very different estimates, ranging from 6.3 million to 21 million children aged 6-10 out of school. When the definition of primary is expanded to include ages 6-13, the survey data estimate rises all the way to 36.9 million children.

It may be tempting to treat India, with 123 million primary aged children, as an exceptional case and dismiss these large data discrepancies as equally exceptional. In some ways this is justified, since few other countries even come close to the school aged

population of India. On the other hand, India could also be representative of the degree of uncertainty that might be compounded across countries at the regional level. The approximate 123 million primary-aged children in India is on a par with an estimated 132 million in sub-Saharan Africa, 168 million in East Asia and the Pacific, and 176 million in South and West Asia, according to UIS. While it difficult to construct or communicate an estimate of the degree of uncertainty that exists across the aggregate of all of the countries in any of these regions, India reminds us of the impact that uncertainty in measurement for large geopolitical units can have on our understanding of the global scope of the out of school challenge.

It may not be possible to fully reconcile the discrepancies in the estimates of out of school children resulting from different sources in both Kenya and India. However, more can be done to investigate the gaps. Improving the transparency of estimation methods and potential sources of error would be a useful first step in this direction. A case-by-case investigation, similar to the one described in the UIS and UNICEF (2005) report, is likely to shed light on this uncertainty, and help countries establish clear baselines and targets in reducing barriers to access. The 26 country effort started by the Global Initiative on Out-of-School Children is an important step in this direction—as is the much anticipated report on India currently in development by the Initiative.

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<sup>36</sup> 309,000 if the primary school age range is defined as 6-11 and preschool, primary, and secondary are all counted as “in school.”  
1,050,000 if the primary school age range is defined as ages 6-13 and primary and secondary are counted as “in school”, but preschool is not.

## CHAPTER 4:

# Can measurement challenges be resolved?

Getting a good gauge on the number of out of school children at the primary level around the world is a complex undertaking. In addition to the basic challenges of obtaining exclusion data in a timely manner, particularly in post-conflict environments, there are a multitude of decisions to be made about which data to use and how to use them.

There are varying interpretations of what constitutes school, which age groups fall within the primary school population, and the appropriate age to enter primary school. Further, in the analysis of enrollment or attendance data, considerations such as entry age adjustment and sample sizes for subnational breakdown of out of school rates play an important role in one's ability to present internally consistent and statistically reliable results. Furthermore, where more than one source of information exists, there are discrepancies across sources that are difficult to fully account for.

With all of this complexity, is there a way to establish an international metric for monitoring school participation and conversely, school exclusion? In this chapter, we offer ideas for tackling some of the data challenges and creating a more complete and internally consistent measure of school exclusion. These include:

- Streamlining common definitions by expanding the concept of “in-school” and measuring participation for an age cohort, rather than level of education
- Ensuring the timeliness of data collection or proper adjustment for time trends
- Expanding the use of household survey data, and
- Building a shared understanding of the limits of existing data and the methods used to address data gaps.

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## Streamline the basic definitions

### Expand the definition of “in-school”

The measurement of school exclusion is derived from two basic figures: the number of children of primary school age who are out of school, and the total number of children of primary school age in a given country. As we noted above, UIS defines “in school” as enrollment in the formal education system at the primary or secondary level (UIS & UNICEF, 2005; UIS, 2013). However, as the Kenya case study indicates, the strict focus on formal education may underestimate educational participation in areas where unregistered schools serve a large segment of the population. Research by APHRC (Oketch et al., 2008a) indicates that, in some contexts, unregistered private schools may be the preferred choice of low income families, indicating that an overly restrictive definition of school participation may inflate the scope of school exclusion. While legitimate concerns may exist about the quality of educational provision at non-formal schools, a growing body of evidence indicates that non-formal schools can be effective at providing students with basic skills (Chabbot, 2006; DeStefano et al., 2007). At the same time, the quality of educational provision at formal government schools is a concern in a large number of lower-income settings.

Further, with growing international pressure to remove barriers to school access, there is greater acceptance of innovative models that bypass

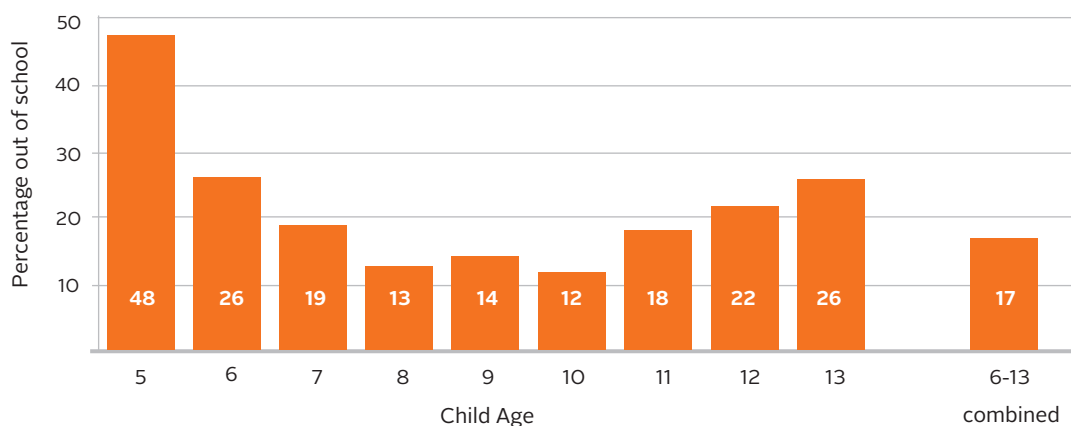
traditional government school systems and may or may not follow the same structural framework as formal schools. Were substantial progress made in reaching out of school children through innovative non-public models, then it is important that these numbers be reflected in official government school participation indicators. Capturing and registering the scope of non-formal school participation is not always possible through standard school-based administrative instruments, particularly since many of these schools are not officially registered, but household surveys can be used to gather this information directly from families. With the use of such instruments in contexts where non-formal educational establishments are prevalent, one can obtain a more complete picture of educational opportunity than would be possible through formal school registration data alone.

**Measure participation for an age cohort, rather than by level**

Redefining the common denominator is another step towards consistency in measurement of school exclusion. At this time, UIS indicators disaggregate out of school children by level, capturing participation

of “primary-aged” or “lower secondary-aged” children. As we note in Chapter 2, there is variability between national definitions of primary education and the internationally adopted ISCED definitions, with national versions sometimes encompassing more grades in primary school than ISCED-1 (Figure 2.2). Furthermore, across countries there is substantial variability in the duration of primary even within the ISCED-1 definition, with primary cycles ranging from four to seven grades. This variability has direct implications for the comparability of out of school rates, even before they get translated into numeric counts of children: using the example of India, as Figure 4.1 demonstrates (using the same data as presented above in Figure 3.4 from India 2006 NFHS), attendance ebbs and flows across age groups, with younger and older children less likely to attend than the children in the “core” ages of the official primary school cohort. Therefore, summary rates may vary substantially depending on which age groups are included in the denominator: it is 17% for the ISCED-1 primary cycle, which corresponds to ages 6-10, or 19% for the national full primary cycle, which lasts from 6 to 13 years old.

**FIGURE 4.1: DISTRIBUTION OF OUT OF SCHOOL CHILDREN BY AGE IN INDIA**



Source: EPDC extraction of DHS dataset.

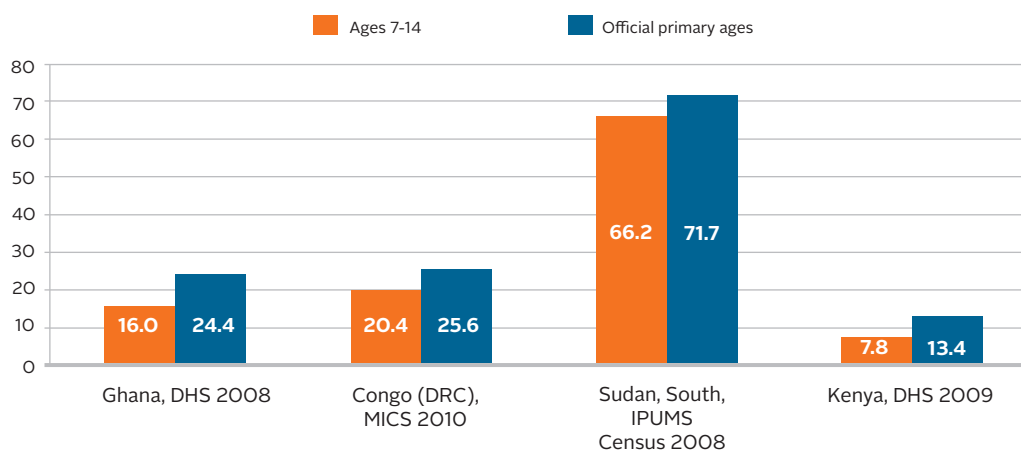
While it is hardly desirable to place a one-size-fits-all approach on the diversity of national education cycles—even the standardized ISCED definitions are based on content, skills, and competencies acquired at each stage of the formal education system—an internationally adopted aggregate measure of school exclusion does demand a certain horizontal consistency. Without such consistency, a change of policy on the duration of primary or pre-primary education in just a few countries may result in sizeable changes in their out of school rates, as was the case with Syria (Chapter 2), and consequently cause regional and global aggregate statistics to shift without any actual change in educational participation. Examining participation for an age group, where the out of school rate and number of out of school children are tracked for a population of specific ages, may be a good solution for this measurement issue.

An age-cohort approach provides the benefit of stepping back from the arbitrary and variable definitions of primary, lower secondary, or upper secondary education. Instead, we pose the

question—what are the ages at which children can be reasonably expected to be in school? Age 7 serves as a practical lower bound: in all countries, compulsory education begins by age 7 or earlier. As an upper bound, we follow internationally accepted norms: the ILO Minimum Age Convention of 1973 establishes age 15 as the minimum legal age for entering any form of employment, thereby setting an expectation for children ages 14 and below to be in school or another form of child care<sup>37</sup>. The 1989 Convention on the Rights of the Child guards against enlisting in armed forces below the age of 15. Measuring school participation for children ages 7-14 captures the bulk of the population that is expected to be receiving basic compulsory education in most countries. We recognize that in many education systems, graduation exams or other high-stakes tests determine progression from primary to lower secondary, which would affect out of school rates for older children in these age brackets. However,

<sup>37</sup> The ILO Convention allows for an **initial** specification of minimum age of 14, with the provision that countries specify the reasons for doing so, and agree to a timely transition to age 15 as the minimum legal age for work ([http://www.ilo.org/dyn/normlex/en/f?p=1000:12100:0::NO::P12100\\_ILO\\_CODE:C138](http://www.ilo.org/dyn/normlex/en/f?p=1000:12100:0::NO::P12100_ILO_CODE:C138)).

**FIGURE 4.2: OUT OF SCHOOL RATES FOR THE TRADITIONAL ISCED-1 DEFINITION OF PRIMARY, WHICH VARIES BY COUNTRY, AND FOR CHILDREN IN THE 7-14 AGE GROUP**





country specifics notwithstanding, based on the international norms cited above it can be argued normatively that at a minimum, children of these ages should be in school, rather than working, married, staying at home, or in the army.

In Figure 4.2, we present the out of school rates for the 7-14 age cohort plotted against out of school rates based on the ISCED-1 definition for a few selected countries. Measurement based on age cohort brackets will help establish a common and intuitive reference point for tracking access to education.

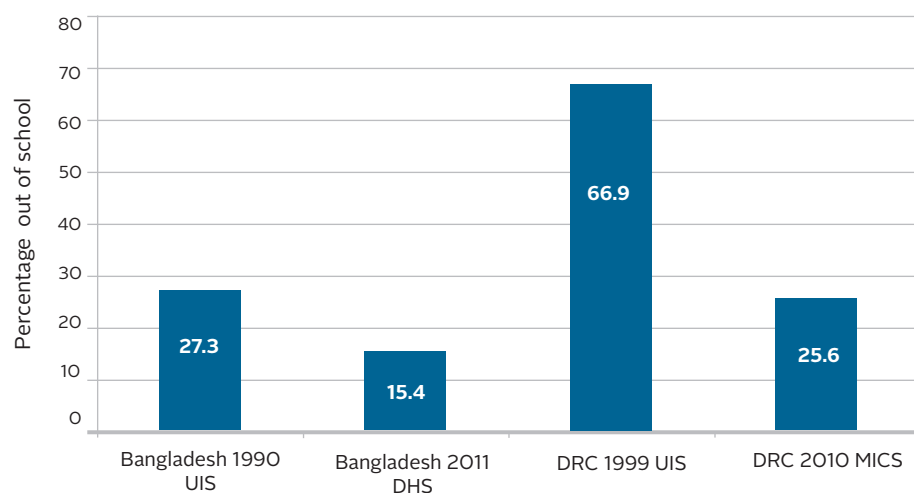
### Improve timeliness of data or adjust for time trends

As we have demonstrated in Chapter 1, the timeliness of data on out of school children is another serious challenge. For most countries, the data points span a ten-year period, but in some cases, such as the Democratic Republic of the Congo (DRC) and Bangladesh, the most recent published UIS data on out of school children date back to the nineties: 1999

for DRC and 1990 for Bangladesh<sup>38</sup>. Fortunately, for both of these countries, there are household surveys for the years 2010 and 2011, respectively, and out of school rates based on the survey data show a dramatic difference when compared to the older administrative values: In DRC, 27% on the 2010 MICS as compared to 67% in 1999 (UIS), and in Bangladesh, 15% on the 2011 DHS as compared to 27% in 1999 (UIS). Notwithstanding the differences in the data collection and calculation methods between administrative and survey sources, it is plausible that access to education may have substantially improved in these two countries over the years since the UIS data was collected. As the violent conflict in DRC has gradually reduced with the signing of peace accords in 2003 and other efforts, we would expect to see an increase in the scope and reach of the education system, with increasing enrollments particularly at the primary level. In Bangladesh, a number of active non-formal education providers have made it possible for many poor rural children to attend school in their

<sup>38</sup> The number of out of school children in Bangladesh is not officially published at the time of this report in the UIS Data Centre, but 1990 data are available on the UIS e-Atlas on Out-of-School Children.

**FIGURE 4.3: TIMELINESS OF DATA**



Note: Out of school rates from official administrative (UIS) and survey sources

own communities, which would have an effect on overall participation numbers (Chabbot, 2006).

Even when the timeliness of administrative data is less extreme than DRC or Bangladesh, available country-level values generally range across several years. The populations of most countries are not static, so some adjustment for this fluctuation must take place. In the UIS e-Atlas on Out of School Children, population trend adjustments are not applied to country-level numbers, and the dataset contains the most recent available country data for regional and global values, ranging across a number of years. Non-adjustment is a methodological choice, based on the assumption that both the out of school rate and the number of out of school children remains virtually unchanged across the time period covered by the available data. Exclusion of the outdated number is also a choice, resulting in a missing value where in fact some information may be available. While UIS reports that imputed values reflect time trends, adjusted values are not published, making it difficult to assess the assumptions driving the adjustment (if any took place).

An alternative method is to perform a population-trend adjustment, with the assumption that the rate remains the same, even if the resulting number does not. EPDC has performed population growth adjustments by applying the most recent historical out of school rate to the estimated population of the respective ages in 2012 (using projections from the United Nations Population Division). This rests on the assumption that within the specified time lapse since the last household survey, the proportion of out of school children in the primary school age population is likely to have stayed about the same—which, by definition, carries greater error if adjustments are performed for longer time series (i.e. extrapolation of data from a point five to ten years prior to the missing value). Contextual information should determine the validity of this assumption: in the case of the DRC above, assuming that the out of school rate remained close to 70% after the peace

accords were signed in 2003 seems unlikely, despite continuing violence. In the case of Bangladesh, the time span of 22 years makes a population-only adjustment less than useful. However, in the case of India, where the time lapse between the year of the latest survey and our target year of 2012 is only 6 years, a population adjustment with the assumption of a stable rate appears reasonable - unless evidence of a dramatic improvement in school participation exists within this brief time period.

### Education projections

In addition to accounting for population growth, time trend adjustments can also be made for the out of school rate in a given country. In most countries, the rate is on a downward trajectory as governments put more and more resources into expanding primary enrollment. Depending on the availability of data across a time series for a given country, a simple trend extrapolation (linear or nonlinear, depending on the existing trend) may be a valid method for forecasting the out of school rate and adjusting for expected change. Other methods include conditional imputation, where a relationship between several variables is first identified using analysis of historical panel data, and extrapolated into the future. However, given the scarcity of data on this indicator, such extrapolation from historical data is not always possible.

Where only a few data points are available, or when no discernible pattern can be traced across the time series, projections can be made based on trends from larger datasets, with data from several countries at a similar level of access and other education indicators. However, this requires stronger assumptions about the stability of education systems and the similarity of countries grouped for trend analysis. Elsewhere, we have developed projections of out of school rates for groups of countries within the Global Partnership for Education by identifying past relationships between expansion of new entries into primary, the repetition and dropout rates, subsequent growth of enrollment in primary grades, and modeling the

Adjusted Net Enrollment Rate (ANER) for children of primary school age (GPE, 2012). More analysis can be done to explore trends in the expansion of access and its driving forces within the education system and model the effects of policy and resource availability on the reduction of the out of school rate. Even more work is necessary to explore the potential of modeling change in post-conflict environments, where school access is most challenging and substantive rapid improvement is most needed.

It goes without saying that any time trend adjustment performed on past, historical data, or imputed through projections methods derived on multi-country datasets, is inferior to the use of current data from reliable sources. Time-adjusted data can never be thought to carry the same degree of reliability as current values (provided that current data in use meet basic quality standards).

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## Expand the use of household survey data

In the previous chapters, we discussed the discrepancies between administrative and household survey sources of school participation information. We have demonstrated that these discrepancies can be substantial, such as in the case of India. We also discussed the basic conceptual difference in statistics arising from administrative sources vs. survey sources: while administrative-based counts are proxies, calculated as the difference between an estimated population of a certain age and the number of pupils of that age registered in the school system, the household survey or census data captures the proportion of respondents who report not attending school even once during the previous school year, and apply that proportion to the estimated population of that age<sup>39</sup>. Attendance at least once in a school year is a generous measure of school participation—not dissimilar from the

concept of school registration. There is little doubt that a more extended measure, differentiating regular attendance from nominal attendance, would be useful for understanding the global issues of school access. Nonetheless, household surveys (or censuses) carry the benefit of directly reaching those who are outside of the school system, whereas administrative systems by their very nature only account for those who are officially enrolled.

Surveys are also valuable for the amount of information that they gather about children who do not participate in school systems—in particular, the household environments and socioeconomic situations in which they live, as well as their health conditions and health-related practices in their homes. This information is extremely useful for understanding the relative importance of different barriers to school participation such as gender, poverty, distance to school, etc., which in turn is crucial for designing effective policies and interventions, and for identifying the groups of children who are “at-risk” of dropout (Lewin, 2007). The Global Initiative on Out-of-School Children applies the Five Dimensions of Exclusion framework to survey data in participating countries (UIS & UNICEF, 2011). Chapter 2 discusses the importance of understanding inequality in access to education among subpopulations within countries and examining the extent to which socioeconomic disparities affect out of school rates. Using survey data, one can construct patterns of exclusion within and across countries and measure the different rates of progress within subgroups of out of school children. Understanding the diversity of characteristics of out of school children is even more important in settings where they are a fraction of the overall population, since they are hard to reach through existing systems and policies. Locally contextualized information is of extreme value to local actors that carry the heaviest weight in removing barriers to primary education.

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<sup>39</sup> Population data are provided by the United Nations Population Division.

Notwithstanding these benefits, however, there are important limitations to survey-based statistics. As we noted in Chapter 2, surveys may systematically exclude certain populations from a national sample. Lack of safety, for example, may prevent enumerators from sampling a given geographic area. Such exclusions are noted in the methodology documentation, making it possible for the users of this information to determine the generalizability of the data. Household surveys also exclude institutional settings such as orphanages and refugee camps, and lack the capability to sample nomadic groups. To the extent that such populations are prevalent in a country or a subnational division, this systematic exclusion may bias the estimates (UIS, 2010). Available surveys are also severely limited in the information they provide on the types of schools that the students attend, which arguably can be collected from school census information, although a growing number of household-based research instruments seek out the name or other identifiers for the school reportedly attended by the student. It goes without question that there is substantial room for improvement in terms of the detail provided by surveys. Linkage of survey data with school identifiers, where possible, would substantially improve our understanding of the complex school/family environments in which children live<sup>40</sup>. To some extent this is done by some surveys (UWEZO, 2011).

Finally, all surveys are subject to some degree of sampling error (particularly as samples are broken into subgroups), although this is generally not a serious concern with international studies that have large sample sizes, such as DHS and MICS<sup>41</sup>. The review completed by UIS and UNICEF (2005) points to the discrepancies in age distribution of single-year-age groups in some DHS surveys, but notes that these discrepancies generally do not

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<sup>40</sup> Links with EMIS systems, where they are available, would advance this effort.

<sup>41</sup> Community-based surveys such as ASER and UWEZO have even greater sample sizes; however, some of them deliberately exclude certain populations (like urban centers in India), making it difficult to generalize across the nation.

affect estimation of net attendance rates—only the estimations of the numerators (children not attending). On the other hand, the availability of micro data from surveys also allows for a direct estimation of confidence intervals (and hence, the bounds of uncertainty) around the statistics, which can be factored in when results are tracked across time and across different units of analysis (i.e. subnational units or countries where the same survey was administered).

At this time, survey-based out-of-school information is not included in the official statistics on school participation. In a situation where missing data are as serious a challenge as in the case of the global measurement of out of school children, exclusion of survey sources exacerbates the problem by adding gaps where information may actually be available. Earlier efforts by UIS and UNICEF to integrate all available data (UIS & UNICEF, 2005; UIS, 2008a) acknowledge the rigorous sampling and instrument design methodologies of major surveys like DHS and MICS<sup>42</sup>, which are carried out in close collaboration with national statistical agencies and non-government counterparts. These surveys are recognized for the internationally comparable population, health, nutrition, fertility, and HIV indicators that they produce, and hence, carry a substantial degree of international legitimacy. The level of national government involvement in the administration of surveys like DHS and MICS varies by country. The India survey, for example, was administered under the auspices of the Ministry of Health and Family Welfare, and is cited as National Family Health Survey. Other high quality household surveys carried out by national actors include the annual General Household Survey for South Africa, administered by the national government agency Statistics South Africa, and the Brazilian Census Bureau (Instituto Brasileiro de Geografia e Estatística, IBGE), among others.

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<sup>42</sup> For more information on DHS and MICS, see [www.measuredhs.com](http://www.measuredhs.com) and [www.childinfo.org/mics.html](http://www.childinfo.org/mics.html).

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## Build a broad understanding of data quality concerns

As we have stated above, absolute precision is hardly attainable, but progress can be made in terms of strengthening the quality (i.e. reliability and validity) of country-level and subnational measures, as well as the consistency of metrics across countries. Generally, the greater the level of aggregation, the greater the monitoring challenge in terms of missing data, varying quality in data collection and analysis, underlying population shifts requiring adjustments, and different interpretations of what constitutes primary school participation. The 2005 UIS/UNICEF report on children out of school sets the global baseline at 115 million children at the primary level, using available administrative and survey data for the period of 1999-2002. However, the UIS database shows 108 million in 1999, and 95 million in 2002. This discrepancy reflects the inherent complexity of trying to track access and exclusion on a global scale. Global estimates also hide a substantial amount of noise originating from the measurement of out of school rates in developed countries, such as OECD states (see Chapter 1 of this report). In order to strengthen measurement on global and regional level, more work is necessary to improve the measurement of out of school children at the country level, while larger-scale aggregate values should be taken as proxies, rather than direct measures of reduction in school exclusion. At the same time, greater openness about the amount of uncertainty, variability in underlying definitions, and potential reliability concerns would help build a deeper understanding in the education and development community about the limits of available information.

Dealing with missing administrative data at the national level is a great challenge, particularly when other sources of information are scarce. Given the high degree of measurement error around any estimate, particularly an imputed one, it is useful for all parties, including the end consumers of the data, to have an understanding of the methods and sources

used to fill in the gaps and be sensitive to any reliability and validity issues. In any given year since 1999 (the first year that the UIS database provided official statistics on out of school children), close to 40% of country-level data were not published (UIS Data Centre, 2013), indicating they were either not reported by countries, or were deemed unreliable by UIS.

While UIS reports using a variety of methods and sources, including reference to surveys, to impute missing data, information on which data are used in place of missing values on out of school children is not available for the general public at this time<sup>43</sup>. This lack of transparency and acknowledgement of the extent of imputation vs. use of actual data makes it difficult to assess what specific data quality concerns exist, how they are addressed, and to what extent they affect regional and global aggregate measures. Based on the level of missing data, the size of uncertainty may be quite large. Greater discussion around the quality of administrative data, as well as the methods used for developing regional and global estimates of out of school children would be a useful step towards alleviating data quality concerns and improving the prospects for consistent monitoring against global goals. We fully recognize that effective communication of technical and methodological information to broad audiences can be a challenge, and yet there have been examples where it was done with success. The UIS/UNICEF 2005 report on out of school children serves as a great example of a thorough review of all data sources, including all household survey sources, and a candid discussion of the incredibly complex exercise that is the measurement of educational exclusion on a global level. Subsequent analyses of the status of school participation around the world would do well by following the same methodology and level of documentation and openness on data reliability concerns.

The data challenges we discuss in this report are

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<sup>43</sup> A general imputation methodology is offered on the Frequently Asked Questions section of the UIS website, and discussed in Box 1.1. of this report.

substantial, but not insurmountable. In this chapter, we proposed a few steps that would help address these challenges, from the national and subnational to global levels. By expanding the definition of school participation, standardizing the population for which access is monitored, and above all, establishing greater openness about data inconsistencies, gaps, and quality concerns, we can build a more complete measure of school exclusion—and consequently, improve our ability to capture progress made in expanding educational opportunity around the world.

## CONCLUSION:

### Big picture, sharp focus

Global dialogue on educational exclusion, and specifically on access to primary education in the past two decades, has resulted in a tremendous mobilization of policy initiatives and resources to expand primary enrollment and close the gender gap in education. With the nearly universal removal of primary school fees, the “low-hanging fruit” has been picked, and remaining challenges in access require a different toolkit of solutions.

Continuing this large-scale advocacy effort with a particular emphasis on the more difficult school exclusion challenges is crucially important for sustaining the effort in providing every child a chance to receive a quality education. However, as advocacy efforts give way to programmatic interventions and monitoring and evaluation activities are put in place, the importance of timely and reliable measurement becomes difficult to overestimate. This report is intended to highlight existing data challenges, and contribute to a nuanced understanding of the measurement of school participation and exclusion.

Using the current UIS global estimate of out of school children as a starting point, and reviewing the data published on the UIS e-Atlas, we began with a general overview of the data on school access, and identified missing and outdated data points that seem to contribute to the global measure. In Chapter 2, we provided an overview of the sources of variation across existing sources of school exclusion data and pointed out the need to streamline definitions and standardize metrics to improve international comparability of school participation statistics. In Chapter 3, we illustrated the measurement variability with two country cases, looking at both national and subnational data for Kenya and India, and discussed the impact that conceptual differences can have on our assessment of the barriers to school participation. Finally, in Chapter 4, we summarized and offered a discussion

of the key aspects of measurement that require a high degree of consensus across data collection agencies, including measurement against a standard age range. We also call for greater discussion and acknowledgement of the limits of available data, the large extent of missing data, and the imputation methods used to fill in the missing values factored into the regional and global aggregates<sup>44</sup>.

We recognize the resource and capacity constraints that lie at the heart of the data quality issues. However, there are steps that can be taken even now, to improve the completeness and consistency of international metrics of school exclusion. They include a reorientation of measurement for a standard age group, an expanded definition of “in-school” status, greater incorporation of survey data, and greater clarity and transparency on existing gaps and limitations of the data.

Given the complexity and accumulating level of uncertainty as the measure of out of school children is aggregated to higher levels, it is the national and subnational data that should receive the most attention and discussion. Instead of asking, *how many primary-age* out of school children are there in the world, one should ask, in how many countries was the *rate of school exclusion* above 10% for 6-10 year-olds and 7-14 year-olds? In *how many countries*

<sup>44</sup> UIS indicates that a full methodology on out of school measurement is forthcoming.

was significant progress made in the last five years in reducing out of school rates for internationally comparable age cohorts? Deemphasizing large-scale global estimates and global goals in favor of monitoring the growth in the *number* of countries where real progress was achieved in improving school participation rates may be an adequate resolution—and one where emphasis is placed on effectiveness and positive accomplishment rather than lack of progress or stagnation.<sup>45</sup>

Notwithstanding the current challenges of measuring improvements in access (or lack thereof), a concerted effort in strengthening data quality and consistency

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<sup>45</sup> The Global Partnership for Education currently follows this method, tracking progress in countries' achieving mutually accepted targets and milestones—and documents the country-level policy making and implementation process as part of the monitoring effort (GPE, 2012). Data scarcity and lack of reporting on target achievement is also documented and highlighted for country review and response, thereby creating an impetus for strengthening data collection, validation, and reporting.

is an essential element of achieving success on a global scale. A lot has been accomplished, but much work still remains, and in many cases, more resources will need to be dedicated to address data consistency and timeliness challenges. Knowing whether we as a community are making progress in removing barriers to learning opportunities for all children requires having strong and honest metrics against which to track country or regional performance. With a broader understanding of the complexity of data issues, and a willingness to address measurement concerns with specific efforts, these challenges can be resolved and improved metrics made available for general use.



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## APPENDICES

### APPENDIX A: Survey data used in 40 country analysis

Country	Dataset
Bangladesh	DHS 2011
Benin	DHS 2006
Bhutan	MICS 2010
Burkina_Faso	DHS 2010
Burundi	DHS 2010
Cameroon	DHS 2011
Central African Republic	MICS 2006
Democratic Republic of Congo	MICS 2010
Cote d'Ivoire	MICS 2006
Djibouti	MICS 2006
Ethiopia	DHS 2011
Gambia	MICS 2006
Ghana	DHS 2009
India	DHS 2006
Kenya	DHS 2008
Lesotho	DHS 2009
Liberia	DHS 2007
Madagascar	DHS 2009
Malawi	DHS 2010
Mali	DHS 2006
Mauritania	MICS 2007
Mozambique	MICS 2008
Namibia	DHS 2007
Nepal	DHS 2011
Niger	DHS 2006
Nigeria	DHS 2008
Pakistan	DHS 2006

Country	Dataset
Rwanda	DHS 2010
Senegal	DHS 2011
Sierra Leone	MICS 2010
Somalia	MICS 2006
South Africa	GHS 2011
Sudan (post-secession)	IPUMS Census 2008
South Sudan	IPUMS Census 2008
Swaziland	MICS 2010
Tanzania	DHS 2010
Togo	MICS 2006
Uganda	DHS 2011
Zambia	DHS 2007
Zimbabwe	MICS 2009

## APPENDIX B:

### Measurement considerations that may inflate or deflate out of school estimates

		Situations where estimated numbers of out of school children may be deflated	Situations where estimated numbers of out of school children may be inflated
Measurement by level of education	Duration of education	<b>The duration of education cycles varies across countries and even within countries.</b>	
		Estimated numbers of out of school children are deflated where primary cycles are shorter.  <i>For example, in Madagascar, primary education lasts 5 years by national definitions, meaning that the fewer age groups are considered in out of school estimates for primary-age children than the world average of 6 years (UIS, 2005).</i>	Estimated numbers of out of school children are inflated where primary cycles are longer.  <i>For example, in Ethiopia, primary education lasts 8 years by national definitions, meaning that more age groups contribute to out of school estimates than the world average.</i>
		<b>ISCED definitions of primary deflate estimated numbers of out of school children in comparison to national definitions.</b>	
	ISCED definitions of the primary cycle align with national definitions in most cases. The exception is where national cycles are prolonged, usually where the primary is cycle longer than seven years. This means that estimates of out of school children that rely on ISCED use fewer age groups than those that rely on national definitions, where different.  <i>In South Sudan, the estimate of out of school children using ISCED 1 ages (6 - 11) is 1,033,810, which is lower than the estimate using national primary ages (6 - 13) of 1,299,254 (IPUMS census data, 2008).</i>		
Starting age of education	<b>Estimates that use a standard age range (rather than level of education) are inflated where the starting age is below the compulsory education starting age.</b>		
		In Zambia, compulsory education begins with primary education at age 7. Estimates that use an earlier starting age when children are not required to be in school inflate out of school estimates. In proposing 7 - 14 as a standard age range, EPDC has taken into account the case of Zambia and other education systems that do not start school until age 7.	

<b>Population estimates</b>	<b>Data on out of school children that is not current may lead to either over- or under-estimates.</b>	
	In conflict or emergency settings where access to education may be impeded, outdated out of school figures may not capture new challenges to school participation, possibly leading to deflated out of school estimates.	Overall trends worldwide show decreases in out of school children over the past decade. When current figures are unavailable and outdated estimates are used, estimates of out of school children may be inflated.
<b>Definition of in-school</b>	<b>Estimates that count primary-school aged children who are enrolled in pre-primary as in-school may deflate estimates of out of school children.</b>	<b>Estimates that do not include unstructured, unregistered private or community-run non-formal education programs may be inflated.</b>
	<i>Children of primary-school age who are enrolled in pre-primary are not getting age-appropriate education. See Chapter 3 for additional details.</i>	<i>Kenya has many non-formal education programs in operation. Evidence suggests that administrative estimates may not capture the primary-age population enrolled in these programs, inflating out of school estimates. See Chapter 3 for additional information.</i>
<b>Target population</b>	<b>Estimates that do not include all sub-populations may inflate or deflate estimates, depending on out of school rates for those sub-populations.</b>	
	Household surveys may have difficulty reaching populations that live outside of traditional households.	
	<i>Estimates of out of school children are deflated when populations that are missed are less likely to be in school, as is often the case with populations of street children (UIS, 2005).</i>	<i>Estimates of out of school children are inflated when populations missed are more likely to be in school, such as children in orphanages or other institutional care, who may be more likely to attend school.</i>

## APPENDIX C: Glossary of terms used in the report

The following terms and concepts are used widely throughout this report:

- 1. Out of school rate.** The proportion of school aged children in a given country that is not reached by the education system. This term is closely linked to the concept of school participation, which was established by UIS and UNICEF (2005) as “exposure to school during the school year in question” (p. 14). In this report, we elaborate on the use of enrollment and attendance data to estimate school participation, as well as on the benefits and disadvantages of the different data sources currently available. It is notable that UNESCO/UIS applies the out of school rate primarily to describe only those children who would be expected to enroll in primary education, based on the ISCED definition of primary school age range for a given country. We propose to expand the coverage of this statistic to include all children between the ages of 7-14.
- 2. Number of children out of school.** An estimated number of children who are not participating in the school system. Calculated as the estimated proportion of children out of school applied to the estimated population of school age.
- 3. Parity indices.** Indices of inequality, calculated as the ratio of the values for the two groups being compared. The gender parity index for the out of school rate, for example, show the number of out of school girls for each boy out of school.
- 4. School participation.** We use the term “school participation” to encompass both the notions of school enrollment and school attendance, focusing on the active use of schooling options by children of school going age (with our recommended age brackets of 7-14 years old)
- 5. School exclusion.** Lack of access or use of schooling options by children of school age, including children who never attended school and those who attended and dropped out.
- 6. Administrative sources.** Official government statistics, compiled and reported by the UNESCO Institute for Statistics, and/or published through the national statistical agencies.
- 7. Household survey and census sources.** Household survey data, including internationally comparable surveys such as the Demographic and Health Survey and Multiple Indicator Cluster Survey, as well as those implemented by national agencies. Census data accessed by EPDC are gathered and made available by the Integrated Public Use Microdata Series International (University of Minnesota).

**APPENDIX D:**  
Data downloaded from the UIS e-Atlas

Location	# OOSC	Q	Year
Nigeria	10,542,105	**	2010
DR Congo	5,598,022	**	1999
Pakistan	5,125,373	*	2010
China	4,298,503		1997
Bangladesh	4,018,410		1990
Ethiopia	2,389,945		2010
India	2,278,322	**	2008
Afghanistan	2,094,750		1993
Philippines	1,460,431		2009
Côte d'Ivoire	1,160,732		2009
Burkina Faso	1,128,293		2010
Niger	1,085,721	**	2010
United States	1,023,231		2010
Kenya	1,009,592	**	2009
Nepal	926,520	**	2000
Mali	858,255		2010
Yemen	857,302		2010
Ghana	791,049		2009
South Africa	678,531	**	2009
Uganda	622,822		2010
Thailand	611,222		2009
Brazil	594,612		2005
Haiti	571,243		1997
Chad	561,533	**	2003
Iraq	501,445	**	2007
Angola	492,581	**	2010
Madagascar	485,306		2003
Senegal	429,159		2010
Eritrea	417,646		2010
Colombia	374,168		2010
Egypt	368,074	**	2010
Mozambique	366,736		2010
Guinea	354,858		2010
Saudi Arabia	318,434		2009
Papua New Guinea	256,460	**	1990
Indonesia	236,143		2010
Liberia	225,548	**	1999
Russian Federation	220,707		2009
Morocco	207,398	**	2010
Central African Republic	198,386	**	2010
Zambia	184,450	**	2010
Cameroon	179,192	**	2010
Venezuela (Bolivarian Republic of)	171,320		2010

Location	# OOSC	Q	Year
Uzbekistan	164,282		2010
Turkey	161,880		2009
Ukraine	137,694		2010
Tanzania	137,123		2008
Malaysia	136,646		2005
Mauritania	133,538	**	2010
Paraguay	122,636		2009
Viet Nam	121,297		2010
Burundi	120,489	**	2007
Romania	109,035		2010
Sri Lanka	102,107		2010
Lesotho	98,874		2010
Chile	94,211		2009
Poland	93,741		2009
Benin	88,054		2010
Gambia	85,097	**	2010
Dominican Republic	84,674		2010
Jordan	82,699		2010
Algeria	81,638		2010
Azerbaijan	78,445	**	2010
Cambodia	72,886		2010
Peru	65,931		2010
Bolivia (Plurinational State of)	62,696		2007
Malawi	62,275		2009
Jamaica	59,454		2010
Mexico	58,273		2010
Guinea-Bissau	56,640		2010
Djibouti	56,443	**	2009
Congo	56,232	*	2010
Australia	53,764		2010
Albania	52,014		2010
Namibia	51,667		2009
Togo	51,411		2008
Nicaragua	48,167		2010
Occupied Palestinian Territory	48,067		2010
Honduras	46,769	**	2010
Puerto Rico	45,653	**	2010
Costa Rica	43,351		1996
Equatorial Guinea	42,930		2010
El Salvador	38,366		2010
Botswana	38,192	**	2009
Austria	36,451		1997

**APPENDIX D (continued):**  
Data downloaded from the UIS e-Atlas

Location	# OOSC	Q	Year
Argentina	36,423		2005
Republic of Korea	35,309	**	2010
Slovakia	34,085	**	2010
Guatemala	31,697		2010
France	30,743		2010
Swaziland	29,972		2010
Lebanon	29,847		2010
Belarus	28,505		2010
Timor Leste	27,710		2010
Ecuador	26,811		2009
Czech Republic	25,897	**	1999
Italy	25,059		2010
Iran (Islamic Republic of)	23,888	**	2007
Lao PDR	23,215		2010
Israel	23,155		2009
Comoros	22,761		2007
Rwanda	20,208		2010
Bosnia and Herzegovina	20,201		2010
Syrian Arab Republic	18,848		2009
Guyana	18,637		2010
Kyrgyzstan	18,490		2010
Denmark	16,522		2009
Serbia	16,133	*	2010
Tajikistan	15,013		2010
Republic of Moldova	14,936	*	2010
Gabon	14,522	**	1997
Solomon Islands	13,727		2007
United Arab Emirates	11,584		2006
Bhutan	10,027		2010
Greece	9,588		2007
United Kingdom	8,076		2009
Finland	7,860		2010
Mauritius	7,797		2010
Hungary	7,733		2009
Croatia	7,446		2010
Germany	7,184	**	2010
Belgium	6,720		2009
Spain	6,109		2010
Suriname	5,680	**	2009
Montenegro	5,555		2010
Lithuania	5,495		2010
Panama	5,457		2010
China, Hong Kong SAR	5,277	*	2010
Oman	5,240		2009

Location	# OOSC	Q	Year
Tunisia	5,222		2009
China, Macao SAR	4,710		2010
Latvia	4,697		2010
Canada	4,600		2000
Armenia	4,343		2007
Cape Verde	4,235		2010
Portugal	4,202		2009
Switzerland	3,888		2010
Norway	3,657		2010
Sweden	3,597		2010
Kuwait	3,535		2008
Qatar	3,311		2010
Trinidad and Tobago	3,276		2010
Slovenia	3,094		2009
Estonia	2,769		2009
Kazakhstan	2,738		2010
TFYR of Macedonia	2,212		2010
Saint Lucia	2,124	**	2010
Mongolia	2,122	**	2010
Japan	1,979		2010
New Zealand	1,833		2010
Uruguay	1,622		2009
Malta	1,529		2010
Ireland	1,434		2010
Samoa	1,411		2010
Cuba	1,370		2010
Antigua and Barbuda	1,349		2010
Bulgaria	1,252		2010
Belize	1,191		2010
Maldives	1,178		2008
Luxembourg	1,141		2008
Andorra	1,092		2010
Barbados	1,034	*	2008
Saint Kitts and Nevis	937	*	2010
Fiji	909		2009
Bahamas	658		2010
Bahrain	548		2006
Cayman Islands	538		2007
Cyprus	497	*	2010
Turks and Caicos Islands	477	**	2005
Seychelles	403		2005
Vanuatu	358		2005
São Tomé and Príncipe	354		2010
Grenada	345		2009
Virgin Islands (U.K.)	331	*	2010



**APPENDIX D (continued):**  
Data downloaded from the UIS e-Atlas

Location	# OOSC	Q	Year
Brunei Darussalam	331		1995
Netherlands	266		2010
Bermuda	218	**	2010
Saint Vincent and the Grenadines	209		2010
Iceland	167		2009
Tonga	163	**	2006
Marshall Islands	137		2002
San Marino	135	*	2009
Dominica	124		2009
Anguilla	122	**	2008
Kiribati	81	**	2002
Palau	61	**	2000
Aruba	26		2010
Cook Islands	26	*	2010
Montserrat	18	*	2007
Liechtenstein	16	*	2010
Niue	4	*	1999
Georgia	-		2009

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Note: Cell entries are: Total number of out of school children of primary school age (#OOSC), as reported by UIS, UIS qualifiers (Q), and year of the data (Year).

Q = UIS qualifiers:

\* National estimation

\*\* UIS estimation for country-level data. Partial imputation due to incomplete country coverage for regional averages (between 33% to 60% of population)

Data last accessed and downloaded on May 23, 2013.

## APPENDIX E:

### Out of school children % rate and number, Sub-Saharan Africa and South Asia

	Country	School Participation Year	Survey	Estimated Percent and Number of Out of School Children for EPDC Proposed Age Range: Ages 7-14				
				% Out of School with 95% Confidence Interval	# Out of School with 95% Confidence Interval	# Out of School Adjusted for 2012		
SUB-SAHARAN AFRICA	Angola		-					
	Benin **	2006	DHS 2006	32.1	± 1.6	515,896	± 31,317	602,555
	Botswana		-					
	Burkina Faso **	2010	DHS 2010	47.5	± 1.8	1,616,092	± 83,390	1,705,246
	Burundi **	2010	DHS 2010	15.9	± 1.4	250,517	± 24,156	251,448
	Cameroon **	2011	DHS 2011	15.5	± 2	587,769	± 85,029	600,331
	Cape Verde		-					
	Central African Republic **	2006	MICS 2006	38.3	± 2.5	309,521	± 29,508	343,344
	Chad (MICS4 Report)	2010	-					
	Comoros		-					
	Congo Dem Rep **	2010	MICS 2010	20.4	± 1.8	2,872,623	± 289,331	3,026,699
	Congo Rep **	2005	DHS 2005	8.6	± 1.2	58,313	± 9,602	69,708
	Côte d'Ivoire **	2006	MICS 2006	39.2	± 2.9	1,439,923	± 171,958	1,594,231
	Djibouti **	2006	MICS 2006	22.6	± 2.5	36,797	± 4,803	36,861
	Equatorial Guinea		-					
	Eritrea		-					
	Ethiopia **	2011	DHS 2011	32.5	± 2.4	5,773,946	± 491,962	5,836,716
	Gabon		-					
	Gambia **	2006	MICS 2006	35.9	± 2.4	113,873	± 11,092	135,445
	Ghana **	2009	DHS 2008	16.0	± 1.8	708,107	± 85,083	748,933
	Guinea **	2005	MICS 2005	45.7	± 2.5	842,253	± 67,354	950,257
	Guinea-Bissau **	2005	MICS 2006	35.4	± 2.4	96,848	± 7,942	108,190
	Kenya	2008	DHS 2009	7.8	± 2.1	597,630	± 164,924	670,756
	Lesotho	2009	DHS 2009	7.0	± 0.9	30,363	± 4,387	29,928
	Liberia **	2007	DHS 2007	46.7	± 3	311,171	± 28,745	394,920
	Madagascar **	2009	DHS 2008	20.4	± 1.3	855,115	± 63,800	915,695
	Malawi	2010	DHS 2010	9.2	± 1	292,692	± 37,428	308,159
	Mali **	2006	DHS 2006	54.9	± 2.7	1,549,519	± 166,550	1,892,297
	Mauritania **	2007	MICS 2007	38.9	± 1.8	243,003	± 13,776	268,921
	Mauritius		-					
	Mozambique	2008	MICS 2008	17.8	± 1.4	827,838	± 77,086	943,260
	Namibia **	2007	DHS 2006	6.9	± 1.3	29,405	± 5,732	30,264
	Niger **	2006	DHS 2006	63.7	± 2.1	1,825,766	± 120,668	2,281,191
Nigeria **	2008	DHS 2008	28.2	± 1.7	8,289,546	± 526,826	9,239,041	
Réunion		-						
Rwanda	2010	DHS 2010	10.4	± 0.8	216,514	± 16,787	228,704	
Sao Tome and Principe		-						
Senegal **	2011	DHS 2011	38.1	± 2.4	992,268	± 81,560	1,016,566	
Seychelles		-						
Sierra Leone **	2010	MICS 2010	20.1	± 2	235,958	± 26,855	247,985	
Somalia **	2006	MICS 2006	74.1	± 2.9	1,245,625	± 65,217	1,481,754	
South Africa	2011	GHS 2011	1.6	± 0.3	129,286	± 25,041	129,578	

Estimated Percent and Number of Out of School Children of ISCED 1 Ages				Estimated Percent and Number of Out of School Children of National Primary School Ages**				Country
Ages	% Out of School	# Out of School	# Adjusted for 2012	Ages	% Out of School	# Out of School	# Adjusted for 2012	
								Angola
Ages: 6 - 11	32.7	418,638	486,674	Ages: 6 - 11	32.7	418,638	486,674	Benin **
								Botswana
Ages: 6 - 11	48.2	1,306,223	1,377,585	Ages: 6 - 11	48.2	1,306,223	1,377,585	Burkina Faso **
Ages: 7 - 12	15.1	178,877	180,305	Ages: 7 - 12	15.1	178,877	180,305	Burundi **
Ages: 6 - 11	16.9	507,427	520,870	Ages: 6 - 11	16.9	507,427	520,870	Cameroon **
								Cape Verde
Ages: 6 - 11	41.4	263,471	288,662	Ages: 6 - 11	41.4	263,471	288,662	Central African Republic **
Ages: 6 - 11	48.2	922,548		Ages: 6 - 11	48.2	922,548		Chad (MICS4 Report)
								Comoros
Ages: 6 - 11	25.6	2,893,325	3,037,821	Ages: 6 - 11	25.6	2,893,325	3,037,821	Congo Dem Rep **
Ages: 6 - 11	7.7	41,298	49,197	Ages: 6 - 11	7.7	41,298	49,197	Congo Rep **
Ages: 6 - 11	38.6	1,109,174	1,232,916	Ages: 6 - 11	38.6	1,109,174	1,232,916	Côte d'Ivoire **
Ages: 6 - 11	22.9	28,010	28,430	Ages: 6 - 11	22.9	28,010	28,430	Djibouti **
								Equatorial Guinea
								Eritrea
Ages: 7 - 12	34.0	4,598,024	4,637,771	<b>Ages: 7 - 14</b>	<b>32.5</b>	<b>5,773,946</b>	<b>5,836,716</b>	Ethiopia **
								Gabon
Ages: 7 - 12	37.0	90,952	107,625	Ages: 7 - 12	37.0	90,952	107,625	Gambia **
Ages: 6 - 11	24.4	839,103	897,909	Ages: 6 - 11	24.4	839,103	897,909	Ghana **
Ages: 7 - 12	46.1	655,836	738,989	Ages: 7 - 12	46.1	655,836	738,989	Guinea **
Ages: 7 - 12	35.5	74,857	83,278	Ages: 7 - 12	35.5	74,857	83,278	Guinea-Bissau **
Ages: 6 - 11	13.4	820,559	928,162	<b>Ages: 6 - 13</b>	<b>11.4</b>	<b>903,197</b>	<b>1,016,716</b>	Kenya
Ages: 6 - 12	6.9	26,306	25,808	Ages: 6 - 12	6.9	26,306	25,808	Lesotho
Ages: 6 - 11	64.1	341,572	435,796	Ages: 6 - 11	64.1	341,572	435,796	Liberia **
Ages: 6 - 10	19.1	536,026	564,677	Ages: 6 - 10	19.1	536,026	564,677	Madagascar **
Ages: 6 - 11	11.1	280,158	297,075	<b>Ages: 6 - 13</b>	<b>10.6</b>	<b>346,781</b>	<b>366,430</b>	Malawi
Ages: 7 - 12	54.1	1,181,807	1,446,636	Ages: 7 - 12	54.1	1,181,807	1,446,636	Mali **
Ages: 6 - 11	43.6	213,339	236,145	Ages: 6 - 11	43.6	213,339	236,145	Mauritania **
								Mauritius
Ages: 6 - 12	20.0	857,128	971,619	Ages: 6 - 12	20.0	857,128	971,619	Mozambique
Ages: 7 - 13	6.5	24,187	24,832	Ages: 7 - 13	6.5	24,187	24,832	Namibia **
Ages: 7 - 12	62.1	1,390,596	1,733,115	Ages: 7 - 12	62.1	1,390,596	1,733,115	Niger **
Ages: 6 - 11	31.8	7,476,709	8,340,204	Ages: 6 - 11	31.8	7,476,709	8,340,204	Nigeria **
								Réunion
Ages: 7 - 12	11.2	181,382	191,003	Ages: 7 - 12	11.2	181,382	191,003	Rwanda
								Sao Tome and Principe
Ages: 7 - 12	37.3	745,798	765,036	Ages: 7 - 12	37.3	745,798	765,036	Senegal **
								Seychelles
Ages: 6 - 11	20.7	193,731	202,671	Ages: 6 - 11	20.7	193,731	202,671	Sierra Leone **
Ages: 6 - 11	78.9	1,076,318	1,270,617	<b>Ages: 6 - 13</b>	<b>76.9</b>	<b>1,344,949</b>	<b>1,594,563</b>	Somalia **
Ages: 7 - 13	1.5	107,685	107,990	Ages: 7 - 13	1.5	107,685	107,990	South Africa

## APPENDIX E (continued):

### Out of school children % rate and number, Sub-Saharan Africa and South Asia

	Country	School Participation Year	Survey	EPDC Proposed Age Range: Ages 7-14				
				% Out of School with 95% Confidence Interval		# Out of School with 95% Confidence Interval		# Out of School Adjusted for 2012
SUB-SAHARAN AFRICA	<b>Sudan (Post-secession)</b>	2008	IPUMS Census 2008	35.0	± 0.2	2,255,368	± 13,694	
	<b>Sudan, South</b>	2008	IPUMS Census 2008	66.2	± 0.4	1,211,573	± 10,662	
	<b>Swaziland</b>	2010	MICS 2010	2.8	± 0.6	6,792	± 1,382	6,751
	<b>Tanzania</b>	2010	DHS 2010	19.5	± 1.8	1,804,895	± 209,908	1,928,001
	<b>Togo (MICS4 Report)**</b>	2011	-					
	<b>Uganda</b>	2011	DHS 2011	9.1	± 0.9	700,588	± 81,043	724,889
	<b>Western Sahara</b>		-					
	<b>Zambia</b>	2007	DHS 2007	14.5	± 1.4	375,781	± 36,518	432,625
	<b>Zimbabwe</b>	2009	MICS 2009	9.2	± 0.9	234,445	± 27,201	230,494
SOUTH ASIA	<b>Afghanistan (MICS 2011 Report)</b>	2011	-					
	<b>Bangladesh</b>	2011	DHS 2011	16.3	± 1.2	4,162,817	± 341,977	4,140,522
	<b>Bhutan</b>	2010	MICS 2010	9.0	± 0.9	10,215	± 1,029	10,212
	<b>India **</b>	2006	DHS 2006	19.7	± 0.8	38,500,000	± 1,700,000	38,771,505
	<b>Maldives</b>		-					
	<b>Nepal</b>	2011	DHS 2011	9.9	± 2.2	586,087	± 155,797	587,371
	<b>Pakistan</b>	2006	DHS 2007	28.9	± 1.6	9,362,030	± 637,970	9,142,007
	<b>Sri Lanka</b>	2009	-					

Methodology: To create estimates of the proportion of out of school children for a particular school year, EPDC used birthdate information to identify children who were of a particular age range (such as 7-14 or ISCED 1 ages) on the month that the school year began. Children who had attended primary school or higher at any time during the school year were classified as 'in school;' Children who had not attended school at any time during the school year, or who had attended pre-school during that reference period were classified as 'out of school.' The proportion of children who are out of school is calculated as the number of children within the age range who were classified as out of school divided by the number of children within the age range.

To obtain the number of out of school children, the out-of-school rate is then applied to the population of the same age range from the UN Population Division (EPDC obtained single-age population estimates to build the correct age range). UN Population Division figures are provided for mid-year each year, and EPDC uses the population figures from the year closest to the start of the school year in each country. Depending on a country's main academic calendar, the population figure may be from the year before the school participation year. Countries for which this is the case are marked with \*\*.

ISCED 1				National Primary Cycle**				Country
Ages	% Survey School Year	# Survey School Year	# 2012 Adjusted	Ages	% Survey School Year	# Survey School Year	# 2012 Adjusted	
Ages: 6 - 11	41.8	2,125,183		<b>Ages: 6 - 13</b>	<b>39.2</b>	<b>2,589,997</b>		<b>Sudan (Post-secession)</b>
Ages: 6 - 11	71.7	1,033,810		<b>Ages: 6 - 13</b>	<b>69.3</b>	<b>1,299,254</b>		<b>Sudan, South</b>
Ages: 6 - 12	4.3	8,866	8,874	Ages: 6 - 12	4.3	8,866	8,874	Swaziland
Ages: 7 - 13	18.1	1,491,945	1,596,311	Ages: 7 - 13	18.1	1,491,945	1,596,311	Tanzania
Ages: 6 - 11	11.4	106,248		Ages: 6 - 11	11.4	106,248		Togo (MICS4 Report)**
Ages: 6 - 12	13.7	978,863	1,012,446	Ages: 6 - 12	13.7	978,863	1,012,446	Uganda
								Western Sahara
Ages: 7 - 13	14.7	340,259	390,045	Ages: 7 - 13	14.7	340,259	390,045	Zambia
Ages: 6 - 12	8.3	184,377	182,701	Ages: 6 - 12	8.3	184,377	182,701	Zimbabwe
Ages: 7 - 12	44.8	2,436,224		Ages: 7 - 12	44.8	2,436,224		Afghanistan (MICS 2011 Report)
Ages: 6 - 10	15.4	2,434,180	2,406,106	Ages: 6 - 10	15.4	2,434,180	2,406,106	Bangladesh
Ages: 6 - 12	8.3	8,198		Ages: 6 - 12	8.3	8,198		Bhutan
Ages: 6 - 10	17.0	20,900,000	21,024,656	<b>Ages: 6 - 13</b>	<b>18.8</b>	<b>36,900,000</b>	<b>37,058,762</b>	<b>India **</b>
								Maldives
Ages: 5 - 9	20.2	745,687	737,741	Ages: 5 - 9	20.2	745,687	737,741	Nepal
Ages: 5 - 9	32.1	6,616,014	6,307,441	Ages: 5 - 9	32.1	6,616,014	6,307,441	Pakistan
								Sri Lanka

\* National definitions of the primary education cycle are from UNESCO International Bureau of Education country profiles of education

† Bolded national primary cycle estimates differ from ISCED 1 cycle estimates

In this table, EPDC provides 95% confidence intervals for estimates of out of school children ages 7-14. For 95% confidence intervals for estimates for children of ISCED 1 and national primary ages, please email EPDC at [epdc@fh36o.org](mailto:epdc@fh36o.org).



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