Measuring Gender Equality in Education: Lessons from Trends in 43 Countries

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Gender inequalities in primary school enrollment have declined in recent decades in low-income countries, leading some observers to assume that disparities in educational attainment are now limited to secondary and higher education. Amid declarations of victory on school enrollment, policy and programmatic focus has also shifted from attainment to school quality and learning. Yet millions of young people are still not enrolling in primary school (UNESCO 2016a, 2016b). Sustainable Development Goals (SDGs) 4 and 5 focus on quality education and reducing gender inequality, respectively. Progress toward these goals requires a more complete understanding of current global patterns in school enrollment, grade attainment, and learning.

Trends in gender and education policy and outcomes

Gender gaps in primary school enrollment narrowed substantially in many low-income countries during the post-colonial period, beginning in the 1960s (Lloyd, Kaufman, and Hewett 2000; Wils and Goujon 1998). In examining trends in enrollment and attainment in 24 sub-Saharan African countries from the late 1960s to the late 1990s, Hewett and Lloyd (2005) found that only 45 percent of girls and 66 percent of boys had ever attended school in the late 1960s. By the late 1990s these percentages had increased for both groups, but more so for girls: 73 percent of girls and 78 percent of boys had ever attended school. Over the same period, primary school completion levels increased from 46 to 58 percent for boys and from 26 to 53 percent for girls. By the 1980s and 1990s, however, the pace of progress slowed for both groups. These trends were consistent with national policies during that period, when many post-colonial governments prioritized expansion of educational infrastructures alongside strong economic growth. The subsequent combination of economic downturns, rapid population...
growth, and structural adjustment programs resulted in reduced investments in education (Lloyd, Kaufman, and Hewett 2000). Wils and Goujon (1998), who observed similar patterns of progress in expanding primary school enrollment between 1960 and 1990, argued that an overall “education transition” began to take shape during this period in some countries, in which primary enrollment increased for both males and females while gender gaps declined, followed by similar changes at the secondary school level.

In 1990, in light of progress in increasing primary school enrollment and closing gender gaps, the Education for All (EFA) movement, committing world leaders to ensuring primary school enrollment for all children by 2000, was launched at the World Conference on Education for All, in Jomtien, Thailand. The need to focus on girls’ education was identified in the meeting’s background report, which noted that gender gaps in both school enrollment and retention should be addressed, but that other aspects of gender norms were likely to affect students’ abilities to learn while in school (Inter-Agency Commission for the World Conference on Education for All 1990). The EFA movement was renewed in Dakar, Senegal in 2000, with a commitment by 164 countries to achieve six goals by 2015; Goal 5 focused on eliminating gender disparities in education (UNESCO 2015). Alongside strong policy commitments, additional progress was made between 1990 and 2015 in expanding primary school enrollment and closing gender gaps in low-income countries (Grant and Behrman 2010; UNESCO 2016a). The 2016 Gender Review accompanying UNESCO’s annual Global Education Monitoring Report stated that, “in 2014, gender parity was achieved globally, on average, in primary, lower secondary and upper secondary education” (p. 14) (UNESCO 2016b). Importantly, these global estimates included high-income countries, where school enrollment is nearly universal but where boys are sometimes disadvantaged relative to girls.

Based on analyses of Demographic and Health Survey (DHS) data from 38 low-income countries, Grant and Behrman (2010) found that, on a regional level, gender gaps in primary school completion were fully explained by gaps in enrollment rather than in grade progression. By 1990 to 2006, conditional on school enrollment, gender parity in primary school completion had been achieved in all regions studied, with an emerging female advantage (ibid.). In other words, at the regional level, once girls enrolled in school they completed as many grades as boys, if not more. The 2015 UNESCO Global Education Monitoring Report echoed this point (UNESCO 2016a). Rather than this advantage simply reflecting the selectivity of girls who had ever enrolled in school, as one might expect, the female advantage in attainment became stronger between 1990 and 2006, as a higher proportion of females enrolled in school. Grant and Behrman (2010) asserted that, if those trends were to continue, a female advantage in grade
attainment would likely emerge in many regions and that programs aiming to close gender gaps in attainment should therefore focus on primary school entry.

One might reasonably ask why continued investments in girls’ education are necessary, given that, on average regionally, girls progress as far as boys once they are in school (Grant and Behrman 2010), and that, on average globally, gender parity has been achieved in primary and secondary school enrollment (UNESCO 2016b). One reason is that these estimates mask substantial variations in school enrollment and grade attainment within countries and regions (Grant and Behrman 2010; UNESCO 2016b) and ignore other areas of potential gender inequality, such as learning outcomes and post-schooling opportunities (Grant and Behrman 2010; Lloyd 2009). Further, little is known about the changing patterns of gender gaps over time or whether the absence of a gender gap, particularly in countries with low grade attainment, means that gaps are unlikely to emerge (or re-emerge) as attainment increases. Also, as Grant and Behrman acknowledge, gender differences in learning might arise due to experiences both in and out of school, especially in contexts where social promotion from one grade to the next is common.

Beyond the magnitude of gender gaps in school enrollment and attainment, many argue that continued investments in girls’ education are warranted because girls face numerous additional challenges in receiving a quality education (Grant and Hallman 2008; Psaki 2016). Lloyd (2009) noted that, compared to boys, girls face more barriers to staying in school, including earlier marriage and pregnancy, and that girls face greater challenges in entering the labor force. Further, Patrinos (2008) argued that the social returns to girls’ schooling are higher, in part because of women’s greater role in reproduction and childrearing and because the private returns to secondary schooling are higher for girls than boys.

Following proclamations of global success in achieving gender parity in school enrollment (UNESCO 2016b), SDG 4 calls for universal completion of upper secondary education by 2030. The Incheon Declaration for Education 2030, in support of SDG 4, emphasizes quality education and lifelong learning for all (UNESCO 2016b). These are lofty goals, given the UN’s estimates of current levels of attainment: by 2013, only 70 percent of children in low-income countries completed primary school, and only 14 percent completed secondary school (UNESCO 2016a). In fact, UNESCO (2016b) acknowledged that, “if past trends continue, not even the EFA goal of universal primary completion …is likely to be achieved by 2030. The target of universal secondary completion is clearly beyond reach” (p. 24).

As the global community devotes resources to the post-2015 education agenda, a clearer picture of progress and challenges in achieving gender equality in education should inform discussions of which investments are needed. Using DHS data from 43 countries collected at two time points, we
seek to address key outstanding questions, including: How do patterns of school enrollment and progression differ for girls and boys? What is the relationship between enrollment, attainment, and gender parity? Does gender parity in enrollment lead to parity in learning? Where should investments in girls’ education be directed to maximize impact?

Data and methods

The DHS collects nationally representative data on health, population, education, nutrition, and livelihoods in low- and middle-income countries. In order to include recent estimates on gender gaps in school enrollment and completion, we limit our analyses to countries that conducted a DHS since 2007.8 We compare results from these most recent surveys with those from a survey conducted approximately ten years earlier in each country. Since the elapsed time between surveys varies between countries, we selected the previous survey in each country that would produce a gap as close to ten years as possible.

Education data on children and young people aged 6–24 are drawn from DHS household surveys, during which an adult respondent provides information on all household members. Literacy assessments are administered to respondents aged 15–49 as part of individual surveys. DHS data are weighted to be representative at the national and urban/rural levels. Education levels were constructed using the highest level of schooling completed (attainment). Consistent with DHS practice and available data, we defined literacy as the ability to read a complete sentence (or sentences) out loud in a language of the respondent’s choosing; those who could read none or some of the sentence were considered illiterate.

Our analyses proceed in four steps. First, using data on primary school enrollment and attainment for 15–19-year-old females, we identify three stages of development in girls’ education, and group countries by those stages at time 1 and time 2.

Second, using data from time 2, we describe patterns of gender gaps in school enrollment and attainment, based on each country’s stage of girls’ educational development. We define a gender gap as a difference of more than 5 percentage points between the proportion of males and females entering or completing each level of schooling; this gap may reflect either a female disadvantage (positive difference) or a male disadvantage (negative difference).

Third, we discuss several ways in which gender parity in educational attainment—a commonly used measure—may provide an incomplete and misleading picture of progress in achieving gender equality in education. We propose a broader approach to tracking progress that integrates information on the country’s stage in girls’ educational development and when gender gaps emerge.
As a final step, we assess the extent to which parity in educational attainment, when achieved, is likely to translate into parity in learning. We describe patterns of basic literacy among males and females with the same level of educational attainment (completion of primary school) at both time points. We use data from a subset of countries in which literacy was directly assessed in both DHS rounds to show gender disparities in the proportion of young people with basic literacy skills among those who completed primary school at time 1. We also assess changes between time 1 and time 2 in the proportion of males and females able to read a simple sentence, among those who completed primary school.

Results

Table 1 shows the countries and timing of survey rounds included in our analyses. Time 1 data were collected between 1997 and 2007; time 2 data were collected between 2008 and 2014. The mean gap between survey rounds is ten years, ranging from five years in Sierra Leone, Lesotho, Pakistan, and Honduras to 15 years in Togo and 16 in Comoros. The countries included represent multiple regions, but are heavily concentrated in sub-Saharan Africa given data availability. While our analyses are not globally or regionally representative, they include examples of low- and middle-income countries at different stages of girls’ educational development.

Stages of girls’ educational development

At time 1 (1997–2007), on average, 77 percent of females aged 15–19 had ever enrolled in primary school, 49 percent had completed primary school, and 38 percent had enrolled in secondary school. Despite high levels of female primary school enrollment in some settings, none of our 43 countries had achieved universal primary school completion for females at time 1 (not shown).

By time 2 (2008–2014), levels of enrollment and attainment had improved overall. On average, 87 percent of females aged 15–19 had ever enrolled in primary school, 65 percent had completed primary school, and 56 percent had enrolled in secondary school. Universal primary school completion had been achieved in three countries (Colombia, Indonesia, Jordan). Although improvements have likely continued since time 2, the SDG target of universal secondary school completion by 2030 appears unattainable in most countries without a dramatic acceleration of progress.

As is the case with UNESCO’s global estimates, mean values based on these 43 countries mask important variations. Even within this sample of low- and middle-income countries, schooling trajectories for females aged 15–19 followed different patterns. Based on the patterns in our data, we
<table>
<thead>
<tr>
<th>Country</th>
<th>Survey time 1</th>
<th>Survey time 2</th>
<th>Years between surveys</th>
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FIGURE 1  Mean proportion of females aged 15–19 who ever enrolled in primary school, completed primary school, and enrolled in secondary school, at time 1 (solid lines) and time 2 (dotted lines), by time 1 attainment group (high completion, high dropout, and low enrollment)

NOTES: Three attainment groups are: low enrollment in primary school (less than 75 percent); high enrollment in primary school (75 percent or more of young people) followed by high dropout from primary school (less than 75 percent of those who enroll complete primary school); and high primary school enrollment and high completion (75 percent or higher). Countries are weighted equally within groups. Time 1 spans 1997–2007; time 2 spans 2008–2014 (with the exception of India, year 2005). Countries are grouped based on their time 1 attainment.

grouped countries by three stages of educational development based on enrollment/completion levels observed at time 1: 1) low enrollment in primary school (less than 75 percent of young people); 2) high enrollment in primary school (75 percent or more of young people) followed by high dropout (fewer than 75 percent of young people complete primary); and 3) high enrollment and high completion in primary school (75 percent or more of young people completed primary).14

Figure 1 shows the mean levels of primary school enrollment and completion, and secondary school enrollment at both time points, by countries’ stages of girls’ educational development at time 1.15 Thus, for example, among countries classified as low enrollment at time 1, mean primary enrollment was about 50 percent at time 1 and 70 percent at time 2. Categorizing countries this way shows that, perhaps not surprising, the most dramatic improvements between time 1 and time 2 occurred in low enrollment countries. Countries in this group at time 1 experienced an approximately 20-percentage-point gain in mean primary school enrollment and completion, as well as mean secondary school enrollment. The high dropout countries also made notable progress in primary school completion (16 points) and secondary enrollment (18 points), and the high completion countries made
substantial progress in secondary school enrollment (13 points). That is, on average, countries made the most progress at the schooling levels where they had the most room for improvement.

Patterns of gender gaps in enrollment and attainment

At time 1, on average across all 43 countries, an 8-percentage-point female disadvantage existed in primary school enrollment, as well as a 3-percentage-point female disadvantage in primary completion and secondary enrollment. By time 2, the average female disadvantage in primary enrollment had decreased to 4 percentage points, and gender parity had emerged in primary completion and secondary enrollment. Although our sample includes only low- and middle-income countries, this pattern of diminishing female disadvantage is consistent with UNESCO’s findings that global gender parity had been achieved in primary and secondary schooling by 2014 (UNESCO 2015).

Given different meanings and implications of gender gaps, global summaries mask regional and country-level variations. Gender gaps should be assessed within the context of each country’s stage in educational development, as well as the level of schooling at which gaps emerge and grow.

Figure 2 shows mean gender gaps at each level of schooling at time 2, with countries now grouped by stage of female educational development at time 2. Panel A shows that, among all 15–19-year-olds, countries in the low enrollment group had a mean female disadvantage in primary enrollment (12 percentage points), primary completion (10 percentage points), and secondary enrollment (10 percentage points). There were no mean gender gaps in the high dropout group. In the high completion group, despite mean gender parity in primary enrollment, there were male disadvantages in primary completion (4 percentage points) and secondary enrollment (5 percentage points).

However, conditional on enrollment or completion of the previous level, the picture of mean gender gaps changes (Panel B). In low enrollment countries, although more males than females enrolled in school on average, among those who ever enrolled there was no notable gender gap in primary completion or secondary enrollment at time 2. That is, on average the gender gaps in primary completion or secondary enrollment in low enrollment countries were completely attributable to gaps in primary enrollment, not dropout. In the high dropout and high completion countries, the patterns, while less pronounced, indicated that male disadvantages in secondary enrollment were attributable, in part, to gaps in primary completion.
FIGURE 2  Gender gaps at time 2 in school enrollment and completion, among all 15–19-year-olds (Panel A) and conditional on completing previous level (Panel B)

Panel A: All 15–19-year-olds

Panel B: Conditional on enrolling/completing primary school

NOTES: Countries are grouped by female attainment at time 2 and weighted equally within groups. Female disadvantage is signified by a positive difference in male and female attainment; male disadvantage is signified by a negative difference.
Gender gaps in educational attainment as an incomplete measure of progress

The preceding sections showed that a country’s stage of educational development provides critical context for understanding progress in increasing female attainment and achieving gender parity, and understanding the level of schooling at which gender gaps emerge is important context for interpreting gaps in attainment.

Yet, in practice, progress in achieving gender equality in education is often measured much more narrowly, without attention to these two contextual factors. Gender parity in educational attainment is often used as the main measure of progress in achieving gender equality in education, including progress toward Sustainable Development Goal 4. This choice of indicator is intuitively appealing, as it gives an immediate sense of relative levels of school participation, and is also simple to track using available data. In theory, interpretation of gaps in primary school enrollment is straightforward because both boys and girls are starting from a pool of 100 percent of young people eligible to enroll. However, seemingly comparable gender gaps in grade attainment may, in fact, reflect different patterns of progress and present different challenges for policy or other interventions.

By highlighting selected examples from our data, all from time 2, Figure 3 shows four ways in which gender gaps may provide a misleading picture of progress in achieving gender equality in education: A) gaps in attainment may reflect disparities in enrollment and/or progression; B) gaps in dropout may be an artifact of enrollment gaps; C) parity in low attainment countries may mask inequalities; and D) comparable gaps may occur in very different education settings.

Panel A: Gaps in attainment may reflect disparities in enrollment or in progression

As was shown in Figure 2, and demonstrated at a regional level by Grant and Behrman (2010), in many countries gender gaps in primary school completion or secondary enrollment largely reflect disparities in primary school enrollment. While this may be true on average, there are exceptions—countries where gender gaps reflect both enrollment and progression through school. The policies and interventions needed differ depending on the level(s) at which gaps emerge, yet data on gender gaps in attainment may mask these differences.

For example, Panel A shows two countries, Benin and Nepal, with similar gaps in primary school completion levels. In Nepal, the gender gap in primary completion is almost completely attributable to a gap in primary enrollment (i.e., conditional on enrollment, the gap almost disappears),
FIGURE 3  Four examples at time 2 of the limitations of gender gaps as indicators of progress in education

Panel A: Gaps in attainment may reflect disparities in enrollment or progression

Panel B: Gaps in dropout may be an artifact of enrollment gaps (Niger)

Panel C: Parity in low attainment may mask inequalities

Panel D: Comparable gaps may occur in different education settings

NOTES: Panel A: In Nepal, the gender gap in primary completion is attributable to gaps in enrollment, whereas in Benin the gender gap reflects disadvantages in both enrollment and dropout. Panel B: In Niger, although dropout levels were higher for males than females, as reflected by the larger gender gap in primary enrollment relative to the gender gap for primary completion or secondary enrollment, there was a female disadvantage in attainment at every level. Panel C: No gender gaps, but high levels of primary school dropout in Malawi and Senegal. Panel D: Despite comparable gender gaps in Liberia and Colombia, attainment levels are much lower in Liberia.
whereas in Benin the gender gap in attainment reflects female disadvantages in both primary enrollment and dropout.

At time 2 in our full sample, 14 countries had female disadvantages in primary school completion among all 15–19-year-olds. While on average, as noted above, the gender gaps in low enrollment countries were attributable to gaps in primary enrollment, three countries (Benin, Côte d’Ivoire, Togo) also had female disadvantages in dropout during primary school. Data on gender gaps in education must include information on the level of schooling at which gaps emerge and then grow or narrow.

Panel B: Gaps in dropout may be an artifact of enrollment gaps

At time 2 in Niger, 24 percent of males compared to 14 percent of females dropped out during primary school. This can be seen in Panel B, where the large female disadvantage in primary enrollment narrows by primary completion. This comparison alone, without information on levels of enrollment, may lead some to believe that males were at a disadvantage in schooling. However, a higher proportion of males than females completed every level of schooling. This pattern of higher male dropout was common in our data and contrary to common assumptions about school dropout during adolescence. However, in several countries with higher male dropout, a female disadvantage in primary school enrollment was also observed. Thus, in those settings, males simply caught up with—or dropped down to—the low levels of female enrollment by the end of primary school. In most countries with higher male dropout, nearly all males and females enrolled in school, and a high proportion of both groups—but relatively more males—dropped out by the transition to secondary school. In such cases, the most important policy challenge is likely the overall high dropout levels. Data on gender gaps in dropout, without information on enrollment levels, may create a false impression of which group, if either, is at a disadvantage.

Panel C: Parity in low attainment may mask inequalities

Absence of gender gaps is not always an indication of gender equality. Panel C shows two countries, Malawi and Senegal, with no gender gaps but high levels of primary school dropout at time 2. In settings like this, there may be different gender-related barriers facing males and females, such as pressure on males to earn an income and pressure on females to marry. Alternatively, some barriers, such as high student/teacher ratios, may affect males and females differently (Chin 2005). Finally, some sex- and gender-related experiences, such as menstruation, may present important challenges, even if they do not cause school dropout (Sumpter and Torondel 2013).
In countries where attainment is low overall, the lack of a gender gap may not be very informative with regard to gender inequalities in schooling. Further, gender gaps in enrollment or attainment may emerge as enrollment increases, as occurred in two countries in our sample (Benin, Côte d’Ivoire).

Panel D: Comparable gaps may occur in different education settings

Gender gaps alone may be misleading indicators of where education investments are most urgently needed. Panel D shows comparably sized gender gaps in Liberia and Colombia. In Liberia, attainment levels were low for both males and females. Efforts in these settings should address overall low attainment as well as gender-related barriers to schooling. Gender gaps in high enrollment settings, such as the male disadvantage shown in Colombia, likely have different origins and implications than comparable gaps in countries with much lower levels of attainment. For example, male disadvantages in schooling in high enrollment countries may reflect male advantages in access to labor markets.

Expanding measurement of progress in achieving gender equality in education

Progress in enrollment and attainment

To address the drawbacks of using gender gaps alone as indicators of progress in achieving gender equality in education, we assess progress between time 1 and time 2 on two dimensions: gender gaps and levels of female enrollment and attainment. We divide countries into the following mutually exclusive groups, based on whether gender gaps exist at two key schooling transitions: primary school enrollment and/or progression through primary school. The resulting groups are: 1) lower female enrollment and higher male dropout; 2) lower female enrollment and parity in dropout; 3) lower female enrollment and higher female dropout; 4) parity in enrollment and higher male dropout; 5) parity in enrollment and higher female dropout; and 6) parity in both enrollment and dropout. For simplicity, we do not include all possible combinations of gaps in enrollment and progression because some patterns are rare or do not occur in our data. The excluded patterns may, however, exist in other settings, or emerge in the future in these settings.

In Figure 4, we combine the above gender gap groups (columns) with the stages of educational development (rows) presented in the previous section to create a two-dimensional profile of progress in absolute and relative educational attainment between time 1 and time 2. The expected
FIGURE 4  Transitions in grade attainment level and gender gap group between time 1 and time 2, by country

NOTES: Between time 1 and time 2, 9 countries remained in the same group (yellow dots); 6 countries made progress in female attainment groups, but not gender gap groups (orange arrows); 17 countries made progress in gender gap groups, but not female attainment groups (blue arrows); 3 countries made progress in both female attainment and gender gap groups (green arrows); and 8 countries experienced emerging disparities (red arrows). Gender gaps are considered present when there is a 5-percentage-point difference or greater between girls and boys. High primary enrollment is defined as more than 75 percent of 15–19-year-olds; low primary enrollment is defined as less than 75 percent of 15–19-year-olds. Lesotho had both lower male primary school enrollment and higher male dropout, the only country with this pattern at either time point.
progression in this framework is roughly from the bottom left boxes (low enrollment overall, lower female than male enrollment) to the top right box (high completion, parity at all levels). Although most countries made progress in either gender parity or attainment, only Comoros, Ghana, and Sierra Leone made progress in both areas.21

Many more countries made progress between time 1 and time 2 in closing gender gaps than in substantially increasing female attainment levels. The number of countries with a female disadvantage in primary school enrollment was nearly halved (from 21 to 12) during this interval, and the number with gender parity in primary school enrollment, completion, and secondary school enrollment increased from 12 to 20. Less progress was made in increasing attainment: only six countries shifted to a higher stage of girls’ educational development (female attainment) between time 1 and time 2.

Patterns of progress in this two-dimensional framework further highlight the limitations of using only gender gaps in grade attainment to measure progress in achieving gender equality in education. At time 2, 12 countries had lower levels of female than male enrollment in primary school;22 three of these countries (Togo, Benin, Côte d’Ivoire) also had higher levels of female than male dropout during primary school. While patterns of gender gaps in enrollment and dropout may change as enrollment increases, in most countries at time 2 female disadvantages in attainment were due to gaps in primary school enrollment rather than to gaps in grade progression. Out of the 12 countries at time 2 with female disadvantages in primary enrollment, eight also had low levels of female enrollment, and three had high levels of female dropout. That is, in nearly all countries with female disadvantages, efforts are needed both to substantially increase attainment and to close gender gaps.

Figure 4 also underlines the fact that comparable gender gaps may occur in different education settings. At both time 1 and time 2, female disadvantages were concentrated in countries with low attainment levels, and male disadvantages were concentrated in countries with high attainment. The causes and implications of these gender gaps are likely different, and they should not be equated.

Both males and females were worst off in countries with female disadvantages. That is, female disadvantages are a sign of a weak education system overall, whereas male disadvantages are more common in relatively stronger education systems. Many other researchers have similarly noted this relationship between overall enrollment and the direction of gender gaps (Eloundou-Enyegue, Makki, and Giroux 2009; UNESCO 2016b; Wils and Goujon 1998). Therefore, targeting policies and programs to countries with female disadvantages, and ensuring they address broad challenges in the education system as well as gender-specific challenges, is likely to benefit both girls and boys.
Progress in learning

Gender parity in grade attainment is the measure of progress in girls’ schooling that has received the most attention from policymakers and practitioners, but little is known about the extent to which parity in attainment is likely to translate into parity in learning or post-schooling outcomes. Figure 5 shows the proportion of 15–19-year-olds who were able to read a simple sentence, among those at time 1 who had completed primary school but did not continue to secondary.23

Assuming that students received a quality education regardless of sex, and that skills were retained or strengthened after leaving school, we would expect all 15–19-year-olds who completed primary school to have basic literacy skills; this is clearly not the case. In nine of the 24 countries shown at time 1, less than 50 percent of females who completed primary education had basic literacy skills. Also, among young people with primary school attainment, gender gaps in basic literacy existed in about half of countries at time 1. Female disadvantages were more common than male disadvantages.

A similar pattern is evident in the apparent stagnation—or deterioration in some countries—between time 1 and time 2 in the proportion of young people with a primary school education who had basic literacy skills (see Figure 6). At time 1, on average 70 percent of males and 65 percent of females who had completed primary education could read a simple sentence. These levels appear to have stagnated by time 2, when 69 percent

**FIGURE 5** Percent of 15–19-year-olds with basic literacy, among those at time 1 who had completed only primary school

NOTES: Figure includes only those countries in which literacy was assessed by asking the respondent to read a sentence (or several sentences) aloud at both surveys. We further exclude Bolivia and Nepal, where more than 75 percent of either males or females are enrolled in secondary school at time 1 or time 2. The Mozambique estimates at time 1 are based on a small sample size in both groups: only 99 females and 40 males included in the sample completed primary school and did not continue to secondary school.
FIGURE 6   Change from time 1 to time 2 in the percent of 15–19 year-olds with basic literacy, among those who completed primary school at each time point

NOTES: Figure includes only those countries in which literacy was assessed by asking the respondent to read a sentence (or several sentences) aloud at both surveys. Bars above zero represent an increase in the percent of 15–19-year-olds literate, among those who completed primary school only, between time 1 and time 2; negative bars represent a decline in this proportion. We further exclude Bolivia and Nepal, where more than 75 percent of either males or females are enrolled in secondary school at time 1 or time 2. The Mozambique estimates at time 1 are based on a small sample size in both groups: only 99 females and 40 males included in the sample completed primary school and did not continue to secondary school.

of males and 62 percent of females with primary attainment had basic literacy skills. In ten countries both males and females with primary school attainment were less likely to be literate at time 2 than at time 1; this pattern was observed for females only in an additional two countries, and for males only in an additional two countries. These results for literacy underline the importance of a three-part strategy of promoting educational attainment, closing gender gaps, and improving the quality of education.

Discussion

Using data collected at two time points in 43 countries, we explored progress in increasing female educational attainment levels and closing gender gaps. We found that, on average, female disadvantages in primary school enrollment have decreased over time, and gender parity has been achieved in primary school completion and secondary school enrollment. However, our findings raise two caveats about those achievements: first, global averages mask important variability between countries; second, despite progress in achieving gender parity, attainment levels remain low for both girls and boys in many countries.
On the first point, global gender parity masks the fact that male disadvantages are emerging in high enrollment and high attainment countries, while female disadvantages persist in many low enrollment and low attainment countries. Yet, among those who enroll in primary school, females tend to complete as many grades of school as males. This pattern may change as enrollment and attainment levels increase and a less selective group of girls enters school, although Grant and Behrman (2010) found no evidence of such a change prior to 2000–2006.

As for the second caveat, gender parity in enrollment or attainment does not equate to high levels of enrollment or attainment. Despite gender parity in primary and secondary completion, more than one third of young people have not completed primary school, and more than 40 percent have not enrolled in secondary school. Many more countries made progress in closing gender gaps than in substantially improving female enrollment and attainment levels, pointing to the need for more effective strategies that address barriers (including gender-specific barriers) to enrollment and retention.

In addition, despite progress in increasing enrollment and retention and closing gender gaps, parity in attainment may not translate into parity in learning. Gender gaps exist in basic literacy among those who have completed primary school in about half of the countries in our analyses, at both time points, with female disadvantages more common than male disadvantages. In many countries the proportion able to read, among those who completed primary school, has declined over time, perhaps resulting from rapid increases in enrollment.

Given that global education goals are out of reach for many countries, and confusion as to whether gender parity in education has been achieved, clarity on how to measure progress in achieving gender equality in education is essential. To date, the closing of gender gaps in primary school enrollment and attainment has been used as the main indicator of success. Gender gaps have often been treated as having similar causes, and calling for similar interventions, regardless of the level of schooling at which gaps emerge and grow, the size of gaps, and the overall level and trends in enrollment and attainment. Our results show that gender gaps, on their own, may be misleading indicators of progress. Gender gaps in grade attainment should be evaluated in the context of overall levels of enrollment and attainment. Policymakers and practitioners should assess when gaps emerge within each country in order to design effective interventions to close them. Finally, the absence of gender gaps does not necessarily indicate the absence of overall, or gender-related, barriers to schooling.

As an alternative approach, we presented a two-dimensional framework for understanding how countries have progressed from low enrollment to high attainment levels, and from gender disparities to gender parity in enrollment and attainment. We demonstrated the importance of both
contextualizing gender gaps with information on overall levels of enrollment and attainment and of identifying gender-related barriers to schooling, which may not be reflected in gender gaps in attainment. We also showed, using data on simple literacy assessments, that gender parity in attainment may not always translate into parity in learning and, in fact, there may be a tradeoff between increasing enrollment and improving learning outcomes, at least in the short-term.

Socioeconomic disparities versus gender disparities

Alongside a strong policy focus on closing gender gaps in education, a parallel discussion has occurred regarding whether addressing gender disparities is the appropriate goal for development programs, or whether it would be more effective to address other disparities, notably inequality across economic groups (Eloundou-Enyegue, Makki, and Giroux 2009; Knodel 1997). Filmer and Pritchett (1999), using DHS data from 35 countries, demonstrated that the poor in many countries accounted for most of the remaining gaps in primary school enrollment.

Eloundou-Enyegue and colleagues (2009) described this pattern as “vertical” vs. “horizontal” convergence: horizontal convergence occurs when all socioeconomic groups experience narrowing of gender gaps simultaneously, whereas vertical convergence describes the process whereby wealthier socioeconomic groups experience narrowing gender gaps first, as a country progresses through an education transition, while the poorest girls are the last to experience those transitions. As common barriers to schooling are lifted in low enrollment countries, households may initially differentiate between boys and girls in their investments, and choose to send boys to school first. As a result, gender gaps may emerge in some low enrollment settings alongside progress, and those gaps may close first for the wealthiest families.

Using DHS data from eight sub-Saharan African countries in the late 1990s and early 2000s, Eloundou-Enyegue and colleagues (2009) found evidence for vertical convergence. Although the relative magnitude of gender-related disparities was consistently smaller than the magnitude of disparities related to socioeconomic status, they also found that, in countries with higher total enrollment, the importance of gender was greater than that of socioeconomic status. That is, as enrollment increases overall, gender-related disparities may become relatively more important. Shifting focus away from gender parity as countries traverse an education transition may be ill-advised, even if gender parity currently exists. Policies and programs aiming to close gender gaps, specifically female disadvantages, should continue despite the larger magnitude of socioeconomic disparities in many settings, but these efforts should target investments to the poorest
Obstacles to achieving gender equality in education

Our results show that many countries still face obstacles to reducing gender disparities in enrollment and progression in school, as well as to improving absolute levels of enrollment and attainment. Achievement of universal completion of secondary school does not appear likely in many settings: at time 2, only about half of the countries had more than 50 percent of both boys and girls aged 15–19 enrolled in secondary school; secondary completion for 20–24-year-olds was much lower (not shown).

Most countries in our analyses either made progress or remained in the same attainment and gender parity group between time 1 and time 2. However, gains made in these countries are not necessarily permanent. Eloundou-Enyegue and colleagues (2009) found stalled progress or reversals in closing gender gaps in one out of three countries studied. In part, this is consistent with our finding that gender gaps may initially grow wider as enrollment increases. The authors also found little evidence of momentum—or declining chances of reversal as countries progress—even within countries at relatively advanced stages of a broader education transition. In our analyses, we find no examples of countries regressing between time 1 and time 2 in terms of enrollment and attainment. Although gender disparities emerge in several countries, certain types of gender disparities may accompany progress in attainment for both boys and girls.

Patterns of progress in increasing school enrollment and closing gender gaps should be viewed in terms of the policy and programmatic investments made in these areas, especially since 2000, rather than being seen as a natural process of increase that has unfolded on its own. Beyond reversals in progress that may occur due to policy changes or withdrawal of resources, conflict or other crises may also lead to setbacks.

The Education 2030 agenda aims to broaden policy focus beyond educational attainment by emphasizing the importance of quality education and lifelong learning (UNESCO 2016b). One measure of education quality is whether young people who attend school develop and retain key skills, such as literacy and numeracy. The overall pattern of stagnation and deterioration in the proportion literate among those who completed primary school in our sample may reflect declining school quality as a result of rapid increases in enrollment levels, producing overcrowded classrooms and a shortage of materials such as textbooks. It may also reflect the changing pool of students enrolled in school, as larger numbers of disadvantaged young people enter school who may require additional support and the strongest learners continue to secondary school. Achieving universal primary school enrollment, and even universal secondary school completion, is unlikely to
have the expected demographic, health, and economic impacts if countries are not able to achieve a sufficiently high level of quality to ensure that students develop and maintain strong cognitive skills after leaving school (Grant 2015; Soler-Hampejsek et al. 2018).

Limitations

Our findings should be viewed in light of several limitations. First, we conducted our analyses of primary completion and secondary progression with the age group 15–19 in order to produce the most recent estimates possible of levels of educational attainment and gender gaps. However, if some young people were still attending primary school at these ages, which is often the case in countries where there is considerable grade repetition (Lloyd 2009), our analyses will have been subject to censoring. In countries where a substantial proportion of in-school 15–19-year-olds were in primary school, we may have underestimated attainment levels. The proportion of overage students may also differ by sex (ibid.). Therefore, in countries where boys are more likely to complete primary school than girls, where late entry and repetition are common, and where boys tend to lag behind more often than girls, we may be underestimating female disadvantages.

Data on repetition in school are not available through the DHS, so we are unable to examine this issue directly. However, to assess the robustness of our findings, we ran the same analyses for 20–24-year-old males and females in each country (results available on request). Our results are substantively the same in terms of patterns of progress in attainment and gender gaps, as well as the pitfalls of measuring progress using gender gaps alone. Overall levels of attainment in the older (20–24) cohort are lower, and female disadvantages are more prevalent. In most cases, however, we are unable to determine the extent to which these differences are due to improvements over time between age cohorts or to censoring among 15–19-year-olds, which would lead to lower attainment estimates particularly where there is considerable grade repetition. Our choice to use data from the younger age group is consistent with previous research on this topic (Grant and Behrman 2010; Wils and Goujon 1998).

There are also potential sources of bias in DHS data (as is the case with all datasets) that could affect our results. We assume no differential reporting of age and education by sex in the household data. Our results may be biased if the males and females included in the samples are not representative of males and females in each country. For example, if educated males tend to migrate to neighboring countries for work, data from the sending country may erroneously indicate a male disadvantage in educational attainment. We assessed sex ratios for 15–19-year-olds in the DHS household
datasets (which include data on educational attainment but not literacy) and found that many ratios were skewed, but the bias was in both directions (not shown). Therefore, the errors would not systematically distort our findings.

As is the case when conducting comparative analyses involving many countries, we sacrifice information on important between-country and within-country variations in order to describe comparable patterns across countries. National estimates also mask information about areas within countries where girls (or boys) may be most vulnerable.

Policy and research implications

Although measures of gender parity in educational attainment may not have originally been intended to identify progress in achieving gender equality in education more broadly, they have often been used for that purpose. Further, these measures may not even accurately reflect gender disparities in school enrollment and progression without additional context. Given the widespread use of these indicators, policymakers and practitioners who fail to understand their shortcomings may conclude that further investments in achieving gender equality in education are not needed, or that resources should be channeled to groups that are already advantaged. Our findings point to several research and policy implications.

Gender gaps must be viewed in the context of a country’s stage of educational development. Gender gaps of comparable size in different settings may reflect different barriers and necessary interventions, creating a misleading picture for policymakers. In settings with low levels of primary school enrollment and completion, female disadvantages in school dropout may emerge as enrollment increases. Therefore, the absence of a gender gap may not indicate the absence of gender-related barriers as much as a weak education system. Efforts to overcome gender-related barriers for both boys and girls should take into account shared barriers to school enrollment and retention, gender-related differences in learning while in school and after leaving school, and gender-related barriers to the transition from school to the labor market.

Further, a male disadvantage of 5 percentage points in a setting with high overall levels of enrollment and completion has different policy and programmatic implications than a female disadvantage of the same size at lower levels of enrollment. In high enrollment countries, there is a need to address gender-related barriers to secondary school completion for both males and females. If emerging male disadvantages in these countries reflect incentives to leave school and begin earning an income, we might expect that pattern to become increasingly relevant as more countries achieve high enrollment levels, and potentially more relevant for females in settings
where employment opportunities become more widely available and where females are able to delay marriage and childbearing.

*Gender gaps in enrollment or attainment do not capture all gender-related barriers to schooling.* In particular, a number of countries in our analyses had achieved gender parity in enrollment and/or completion but very low levels of attainment overall. In these settings, it is likely that there are shared barriers to schooling for boys and girls, in addition to gender-specific barriers. Policies and programs in these countries should be designed to address gender-related barriers, rather than assuming that the absence of gender gaps in educational attainment reflects equitable experiences for girls and boys.

*Parity in educational attainment does not necessarily translate into parity in learning.* In some settings increases in enrollment may have led to a deterioration in the quality of education and a lower proportion of young people with basic literacy skills. More research is needed to distinguish the extent to which these patterns reflect compositional changes in the student population at each level or actual changes in the return on investments in schooling. In either case, policymakers and practitioners should not assume that parity in attainment will be sufficient to achieve equality in education outcomes.

*Female disadvantages in school enrollment persist.* By time 2 (2008–2014), 12 out of 43 countries still had a female disadvantage in primary school enrollment, and in nine of those countries this enrollment gap largely explained gender gaps in grade attainment. These disparities are an important indicator of gender-related barriers to education, which may persist after girls enter school and may serve as barriers to higher levels of attainment. Gaps in enrollment highlight the importance of assessing gender gaps at each level conditional on completion of the previous level in order to identify when gaps emerge.

*Global goals are unlikely to be achieved in most settings.* Despite progress between time 1 and time 2, universal primary school completion had been achieved in only one of 43 countries (Jordan) by time 2. The extremely low levels of secondary school enrollment—and even more so completion—demonstrate that the target of universal secondary school completion is likely more aspirational than realistic without significant increases in investments in education in these countries.

**Notes**

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1 As of 2014, 61 million young people of primary school age were not enrolled, 53 percent of whom were girls—the same share as in 2000 (UNESCO 2016a).

2 SDG 4 aims to “Ensure inclusive and quality education for all and promote lifelong learning.” SDG 5 aims to “Achieve gender equality and empower all women and girls.”

3 Hewett and Lloyd used weighted averages for sub-Saharan Africa and noted that the most populous countries in the region also tended to make the most progress during this period, so their estimates were more optimistic in terms of regional averages than they would have been had each country been weighted equally.

4 In their analyses, Wils and Goujon assumed that age groups corresponded neatly to different levels of education, an assumption that has been demonstrated to be problematic due to late school entry and grade repetition in many low-income countries (Lloyd 2009). However, they identified patterns similar to those reported by Lloyd and Hewett (2005) despite different datasets and methodologies.

5 More specifically, Goal 5 focused on “eliminating gender disparities in primary and secondary education by 2005, and achieving gender equality in education by 2015, with a focus on ensuring girls’ full and equal access to and achievement in basic education of good quality” (UNESCO 2015). Millennium Development Goal (MDG) 3 echoed these objectives (ibid.).

6 Specifically, the report noted that, “when enrolled, girls stand an equal or better chance than boys of continuing to the upper grades of primary school” (UNESCO 2016a, p. 159).

7 We use DHS data instead of UNESCO Institute for Statistics (UIS) data for several reasons. UNESCO’s Global Education Monitoring Report analyzes progress in expanding access to school, including closing gender gaps, based on gross enrollment ratios (GER). The primary GER, for example, is the total number of children enrolled in primary school, regardless of age, as a proportion of the population of primary school-age children (UNESCO 2016a). As a result of different methodologies, DHS and UIS estimates of enrollment and gender gaps often differ. UNESCO data come from Ministries of Education (numerator) and censuses (denominator), in contrast to DHS data, which are collected directly from households (both numerator and denominator). DHS data provide estimates of current school attendance, and grade attainment for those out of school, rather than enrollment in the beginning of the school year, as is the case with UIS data. In settings where many students are underage due to grade repetition and late enrollment, UIS data may overestimate enrollment (Grant and Behrman 2010). In settings with high repetition, where boys repeat grades more often than girls (Lloyd 2009), UIS data may overestimate gender gaps in attainment. Hewett and Lloyd (2005) present a more detailed comparison of UNESCO and DHS education data.

8 The only exception is our inclusion of the 2005 India DHS, the most recent survey available. Although a more recent DHS has been completed in India (2015–16), the data are not yet available for public use.

9 In three countries, two prior surveys existed that would have produced either a 13-year or a 7-year gap; in these cases we used the earlier survey available.

10 Respondents were excluded when the required language card was not available or when respondents were blind. The DHS categorizes all respondents who attended secondary school or higher as literate.

11 We exclude secondary school completion for two reasons: 1) levels are very low overall and therefore not informative in distinguishing between countries; and 2) including data on secondary completion would require using an older age cohort, 20–24-year-olds, which would result in less recent estimates of progress.

12 The exception are data from India, which were collected in 1992–93 (time 1) and 2005 (time 2).

13 We define universal primary school completion as 95 percent or more of 15–19-year-olds.
We use 75 percent as the cutoff for high vs. low enrollment and completion based on the distribution in the data. Although a different cutoff would change the countries included in each group, it would not change the basic pattern we seek to highlight.

Online Tables S1 and S2 provide the data underlying these figures, and present comparable data for males. Supplementary tables and figures are available at the supporting information tab at wileyonlinelibrary.com/journal/pdr.

Countries are weighted equally within groups.

Although the 2016 UNESCO Gender Review described a broader vision of gender equality in education, the primary measure of progress in girls’ education is the gender parity index, or the ratio of male-to-female gross enrollment rates.

In practice, even interpretation of gaps in primary school enrollment can be complex. UNESCO uses two related indicators to track school enrollment. Gross enrollment ratios (GERs) are calculated as the number of children enrolled in a level of schooling (primary or secondary), regardless of age, divided by the population of the age group that officially corresponds to that level; GERs often exceed 100 due to overage students. Net enrollment ratios (NERs) are calculated as the number of (primary or secondary) school-age children enrolled, divided by the population of the age group that officially corresponds to that level; NERs cannot exceed 100. In settings where there are systematic gender differences in overage students, GERs may distort gender gaps in school enrollment.

Specifically, there are three combinations we exclude: 1) lower male enrollment and parity in dropout, 2) lower male enrollment and higher male dropout, and 3) lower male enrollment and higher female dropout. At time 1, Lesotho had lower male enrollment and higher male dropout; it is included in the higher male dropout category in our figures for simplicity. Otherwise, none of the 43 countries fell into these three omitted groups at time 1 or time 2.

Online Figures S1 and S2 show country classification by attainment and gender gap group at time 1 (S1) and time 2 (S2).

Male disadvantages emerged by time 2 in five countries with high levels of primary school completion: Gabon, Cambodia, Dominican Republic, Philippines, and Namibia, as well as one high dropout country (Kenya).

These 12 countries are shown in the first three columns of Figure 4: Togo, Benin, Côte d’Ivoire, Nepal, Ethiopia, India, Burkina Faso, Guinea, Mali, Niger, Nigeria, and Pakistan.

This figure is limited to those countries where literacy was assessed by asking respondents to read a simple sentence (or sentences) aloud in both rounds. We also excluded two countries with available data, Bolivia and Nepal, where secondary enrollment was higher than 75 percent, which would indicate that the 25 percent who did not enroll in secondary school would represent a selective group of young people with the poorest school performance.

For consistency, we consider a change of 5 or more percentage points to be an improvement or deterioration.

For example, one of the targets linked with Sustainable Development Goal 4 is to “eliminate gender disparities in access to education” (http://www.un.org/sustainabledevelopment/education/).

Hewett and Lloyd (2005) similarly found that wealth-related inequalities in grade attainment (based on completion of grade 4) were larger than gender-related inequalities in most countries studied. They found that gender gaps in grade 4 attainment had already disappeared among the wealthiest in many countries, while gaps remained among the poorest in many countries—consistent with the vertical convergence pattern described by Eloundou-Enyegue and colleagues.
References


