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Educational Inequalities in the midst of widespread poverty; Diversity across Africa in primary school completion

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Table 2 Percent Completed Primary by Age Cohort and Gender

Country	Age 20-24			Age 30-34			Age 40-44		
	Boys	**Girls**	**Gender gap** [a]	**Boys**	**Girls**	**Gender gap** [a]	**Boys**	**Girls**	**Gender gap** [a]
Benin	38.1	16.5	21.6	33.6	15.6	18.0	26.0	9.5	16.5
Burkina Faso	25.4	12.1	13.3	14.7	6.4	8.3	11.8	4.0	7.9
Cameroon	69.4	60.0	9.4	67.5	43.0	24.5	57.2	30.6	26.7
Central Afr.	49.6	29.1	20.5	51.3	21.8	29.5	46.9	15.1	31.8
Chad	49.9	15.6	34.3	34.3	7.3	27.0	30.5	5.5	25.0
Comoros	53.7	40.9	10.7	46.7	28.2	18.5	25.2	7.0	18.2
Cote d'Ivoire	46.3	34.3	12.1	43.5	27.0	16.5	37.3	28.0	9.2
Dem. Rep. Congo	64.8	45.5	19.3	72.9	44.3	28.6	65.5	29.5	36.0
Ethiopia	23.1	14.3	8.7	25.0	8.2	16.8	16.5	2.6	13.8
Gambia	40.5	20.2	20.3	35.3	11.8	23.5	32.7	13.1	19.6
Ghana	79.5	62.4	17.2	74.3	51.2	23.1	73.1	48.7	24.4
Guinea	35.9	14.7	21.2	31.3	11.2	20.1	27.3	9.1	18.3
Guinea Bassau	41.2	21.4	19.8	32.9	11.0	21.8	27.9	5.5	22.4
Kenya	70.3	62.3	7.9	80.9	65.4	15.5	73.2	40.7	32.5
Lesotho	59.6	82.5	-22.7	55.3	82.1	-26.8	40.4	63.7	23.0
Madagascar	31.2	32.0	-0.8	45.0	38.8	6.2	30.5	22.1	8.4
Malawi	44.2	25.5	18.7	37.2	15.0	22.2	33.0	11.1	21.8
Mali	23.9	11.9	12.0	18.7	9.5	9.3	21.4	7.4	14.0
Mozambique	18.3	8.4	10.0	19.7	7.5	12.1	13.0	1.8	11.2
Niger	30.3	14.2	16.2	20.2	9.0	11.2	11.3	4.0	7.2
Nigeria	78.7	65.4	13.3	72.0	52.4	19.6	60.5	30.9	29.5
Rwanda	39.9	36.1	3.7	41.2	31.3	10.0	30.6	18.7	11.9
Senegal	47.2	33.2	14.0	41.4	19.4	22.0	33.7	18.0	15.7
South Africa	86.2	89.7	-3.5	78.2	73.3	5.0	65.3	60.7	4.5
Swaziland	73.7	79.5	-5.8	70.5	68.3	2.2	67.1	52.4	14.7
Togo	50.3	22.0	28.3	52.9	19.1	33.9	41.6	14.1	27.5
Uganda	47.5	32.0	15.5	44.0	23.7	20.3	44.0	21.3	22.7
Tanzania	71.2	67.2	4.0	75.4	61.8	13.5	50.7	29.7	21.0
Zambia	68.3	54.0	14.3	74.8	53.2	21.6	78.0	46.2	31.8
Zimbabwe	88.4	86.0	2.4	87.9	73.8	14.0	67.8	41.2	26.6

[a] Calculated as males minus females; differences not always exact due to rounding.

Introduction

Rapid globalization has drawn increased attention to the growth of inequalities both within and between countries. As the elite in the poorest countries find opportunities in the global economy, often thanks to their social and political standing and access to superior educational opportunities, the gulf between the rich and the poor has been widening. It has not just been widening within countries but also across countries as some countries appear better positioned than others to capture and build on these opportunities, given available natural and human resources, as well as social and economic investments. Indeed, it is striking to see how much diversity exists even within and across the poorest countries in the extent and effectiveness of human capital investments and their distribution across groups. Gender gaps vary widely as do gaps between rich and poor, between rural and urban, and between the majority or the political elite (according to race, religion, ethnicity, among others) versus minority or other excluded groups.

Within this broader theme it is interesting to focus on education as a source and reflection of social and economic inequality not only because of its recognized value as a key component of human development but also because of its contribution to individual earnings and national economic development. The UNDP Human Development Report, which each year charts nation by nation progress in human development, is built on an intellectual framework developed by Amartya Sen and Mahbub ul Haq, among others, who recognized that human development is about much more than the growth of incomes and is profoundly about the development of human capabilities (UNDP 1990). Knowledge acquisition is a key component of human capabilities. With the spread of mass schooling, knowledge acquisition is often, but not always, associated with formal schooling.

This paper will explore inequalities in education across sub-Saharan Africa—the poorest continent. We will focus on primary completion rates, given that universal primary completion by 2015 is one of the Millennium Development goals. After situating sub-Saharan Africa relative to other regions of the world with respect to current levels and trends in primary completion rates, we will focus on inequalities across and within Africa using data from the Demographic and Health Surveys (DHS) and UNICEF's Multiple Indicator Surveys (MICS). These data allow us to explore within country inequalities and longer term trends in educational attainment. Also, for a subset of countries, we are also able to explore inequalities in literacy, measured objectively rather than through self-reports (widely recognized to be seriously flawed), across countries and income groups within countries.

Given the surprising differences that exist across Africa not only in overall primary completion rates but also in within-country inequalities by gender and household wealth, even among countries that share similar levels of poverty, we end the paper with a series of questions for discussion and further exploration. These questions are directed at identifying the sources of observed inequalities and include various possible explanatory and associative factors, including: cross-country differences in (1) educational investments, (2) school systems, (3) school quality, (4) political systems and governance, (5) accountability and corruption, (6) culture, including gender norms, (7) wealth and resource inequalities, (8) ethnic and linguistic fractionalization , (9) history of conflict, (10) colonial legacy, among others. Some of these questions are questions

that the students can explore independently using the data provided along with other data they may want to collect.

Regional Inequality in Education – the Case of Africa

Building from UNESCO data on the number of students completing primary, the World Bank estimated population weighted primary completion ratios for the developing world by region for the decade beginning in 1990 (Bruns et al 2003).[i] Figure 1 provides a picture of the challenges ahead in achieving Millennium Development Goal No. 2 – universal primary school completion. We see that overall primary completion rates for the developing world as a whole had reached about 80 percent by the beginning of the twenty-first century. The East Asian and Pacific region is estimated to have reached near universal primary, the European and Central Asian region was close, and Latin America/Caribbean and the Middle East/North Africa regions were at about 80 percent with significant progress having been made in Latin America and the Caribbean in the last decade. Progress in the South Asian region has been strong over the decade as well but completion rates remain lower than in the other regions previously mentioned. In the meanwhile, the African region has shown essentially no progress over the decade, rising from 50 to 51 percent. Indeed, the African region has the lowest primary completion rates of any region of the world. It is also the only region that has experienced a rise in poverty rates in the last 10 years (Chen and Ravallion 2001).

[Figure 1]

To understand the case of Africa more profoundly, in terms of within and across country inequalities, we are fortunate to have nationally representative household survey data on education participation and attainment from the Demographic and Health Surveys (DHS), and UNICEF's Multiple Indicator Cluster Surveys (MICS). These data are, with a few caveats, comparable across countries. In Table 1 we present descriptive data on the 30 countries in Sub-Saharan Africa for which we have data representing 91 percent of all youth in the region. Along with survey dates we present U.N. estimates of the size of the population of youth aged 10–24 as of 2005 (United Nations 2007), along with World Bank estimates of the purchasing power parity gross national income per capita (PPPGNI) for the approximate year the children surveyed would have completed primary school (World Bank 2006). Many samples exceed 10,000 and all samples are of sufficient size to allow estimates within a relatively narrow confidence interval. Youth populations across the countries vary enormously from a quarter of a million in Comoros to over 47 million in Nigeria.

[Table 1]

Trends in schooling for each country can be derived from a single household survey by comparing differences in schooling participation and attainment across age cohorts.[ii] One advantage of these data relative to data collected by UNESCO is that the numerators and denominators of estimated rates are derived from the same data source and can be calculated specific to the same age-cohort. Differences between older and younger cohorts can be interpreted as trends as long as the youngest cohort used for comparison has reached a sufficient age to allow for all members of that cohort to have achieved the level of schooling measured.[iii]

Figures 2a and b present estimates of educational participation and attainment rates by five year age cohorts for sub-Saharan Africa as a whole, separately for males and females.[iv] Three indicators are shown: (1) the percent ever attending school, (2) the percent completing four or more years of schooling and (3) the percent completing primary. The trends are based on weighted averages, using the population aged 10–24 in 2000 as the weight for each country (United Nations 2001).[v] Only data from the 30 countries where DHS or MICS2 surveys have been fielded since 1997 are included.[vi] As the earliest date for these surveys is 1997 and the median date is 1999, we can assume that these data provide a picture of trends up through the late 1990s. In the case of the grade four completion rate, the youngest age cohort for which data can be calculated directly from the surveys is 15–19 because late starting ages mean that some children aged 10–14 have not yet had the possibility of completing grade four. Similarly, in the case of the primary school completion rate, the youngest cohort for which data are presented is 20–24 because overage enrollment as well as longer primary school cycles result in the fact that many aged 15–19 have not had the chance to complete primary school.[vii]

[Figures 2a and b]

We can see from the differences between the trend lines that there is substantial attrition for both boys and girls in school participation between first attendance and primary completion, with slightly greater attrition after the completion of grade four than before. We can also see in Figure 2a several worrying recent developments for boys including the stagnation in grade four completion over the last 15 to 20 years at around 69 percent, recent declines in the percent ever attending from 82 to 79 percent, reversing previous trends, and a hint of growing attrition during the first four grades of school. By contrast, progress for girls displayed in Figure 2b shows a steady upward trend from the late 1960s, although there are hints of a recent increase in attrition during grades 1–4 and a slowdown in the rate of growth in the percent ever attending in the last five years.

Given that the trends for all three indicators track very closely together by age, we felt sufficiently confident to use past trends to estimate rates of primary school completion up through the late 1990s. This is done by calculating a weighted average of the differences between indicators (e.g., completing 4+ years and completing primary), with differences for younger cohorts having a greater weight than differences for older cohorts.[viii]

Figure 3 summarizes trends over thirty years in primary completion rates for boys and girls using our estimates of completion rates through the late 1990s. For boys, 58 percent have completed primary school in the most recent period, roughly consistent with the Bruns et al. estimates cited earlier. Additionally, the figure indicates that there has been no progress in educational attainment for boys in the past 20 years. Among the 42 percent who did not complete, roughly half never attended and half dropped out before completing. By contrast, over the same time period, girls' primary school completion rates have risen steadily from a much lower base of around 27 percent to 53 percent by the late 1990s, nearly doubling since the 1960s. For girls, of the 47 percent who never completed primary, slightly more than half never attended and slightly less than half dropped out before completing secondary. The pace of progress for girls has slowed, but remains strong with an additional six percentage point gain in the last decade (more

optimistic than the Bruns et al. estimates presented earlier).

[Figure 3]

These estimates would imply that the gender gap in sub-Saharan Africa, which was very wide in the early days of independence, has narrowed considerably; current estimates for the region suggest an average gender gap of only five percentage points in favor of boys. Based on these estimates, if current trends were to continue, there is a chance that the region-wide gender gap could be eliminated soon; albeit at levels significantly below universal primary completion. This result does not imply that the gender gap will be eliminated in every country, rather that girls will have gained a sufficient relative advantage in some countries to balance their relative disadvantage in others. In fact, the diversity of gender gaps across Africa is widening as girls gain the advantage in a few countries while still lagging behind substantially in others.

Cross country inequalities in primary completion rates by gender

Table 2 presents the country by country data on percent completing primary school by gender among three age groups: 20–24, 30–34 and 40–44. The regional averages presented above disguise a large amount of diversity within the region in primary completion rates, because some of the most populous countries (e.g. Kenya, Nigeria, South Africa and Tanzania) also have some of the highest completion rates and smallest gender gaps.

[Table 2]

In Figure 4, we graphically present levels and trends for girls across the continent with data ranked from high to low (left to right) for completion rates among young women aged 20-24.This figure illustrates not only the large amount of diversity across the continent but also the fact that the absolute progress has been greater in those countries that had already attained a higher level of completion 20 years ago. Current primary completion rates for girls vary from 90 percent in South Africa to only 8 percent in Mozambique.

[**Figure 4**]

A question that arises is whether these cross-country variations are in any way correlated with national income. Leaving out South Africa because its per capita income is 3-6 times as much as any other country, we show a scatter plot in Figure 5 of girls' primary completion rates by PPP GNI per capita. While there is a correlation of .60 and the very poorest countries have much lower completion rates than those that are relatively better off, we also see that some of the very poorest countries have achieved impressive levels of schooling despite their poverty, with Ghana, Kenya, Nigeria and Tanzania being examples. Among the poorest countries with PPPGNI per capita of less than or equal to $1000, the variations in primary completion for girls varies from 8 percent in Mozambique to 67 percent in Tanzania. In countries ranging from $1000 to $2000 PPP GNI per capita, the variation in completion rates across Africa is even wider, from 15 percent in Guinea to 86 percent in Zimbabwe. Fewer countries have data on poverty rates or income inequality measures for the applicable year, but for those that do we find a relatively low correlation between these measures and primary completion rates across

countries (data not shown)

[Figure 5]

In all but four countries – Lesotho, Madagascar, South Africa and Swaziland – girls remained at a disadvantage in the early 1990s as measured by the absolute percentage point gender gap in primary completion rates among the 20–24 age group (see Table 2). In addition, gender gaps to the disadvantage of girls of 10 percentage points or less—the regional average among the 20-24 age group—could be found in Cameroon, Ethiopia, Kenya, Mozambique, Rwanda, Tanzania and Zimbabwe. At the other extreme, gender gaps of 20 percentage points or more still exist in Benin, Central African Republic, Chad, Gambia, Guinea, and Togo, all but one being located in West Africa. Gender gaps for the other 13 countries were in the 10 to 19 percentage point range.

Again it is worth exploring the cross country variation in the gender gap by PPP GNI per capita. In Figure 6, which again leaves out the extreme value of South Africa, we can see no correlation between the gender gap and PPPGNI per capita. Small gender gaps appears among some of the better off as well as the worse off countries within this group; the same can be said for countries with larger gender gaps. Furthermore, the size of the gap does not appear to be associated with levels of completion for boys (see Table 2). We see small gaps in countries where boys' primary completion rates are relatively high such as Zimbabwe, South Africa and Tanzania but also in countries where boys' primary completion rates are extremely low such as Rwanda and Madagascar.

[Figure 6]

Gender gaps have been declining in most countries but not all. The narrowing gender gap in primary completion during the 1980s was not only due to the relatively more rapid progress for girls. It was also due to declines in primary completion rates for boys in ten countries, including some of the most populous—Central African Republic, Democratic Republic of the Congo, Ethiopia, Kenya, Madagascar, Mozambique, Rwanda, Togo, Tanzania, and Zambia. Girls also suffered declines in Kenya and Madagascar.

In Figure 7, using the same ranking as Figure 4 with countries with the highest completion rates on the left and the lowest on the right, we see that current gender gaps vary from a high of 34 percentage points in Chad to a low of a negative 23 percent points in Lesotho, which shows a large female advantage. Some countries have seen a widening gender gap over the past 20 years in absolute terms including Benin, Burkina Faso, Chad, Cote d'Ivoire, Gambia, Guinea, Niger and Togo.

[Figure 7]

Cross country inequalities in retained literacy for young women

Recent DHS data, based on an "objective" measure of literacy, provide a more direct measure of learning outcomes than primary school completion and suggestive evidence of a possible link between poor school performance and attrition.[ix] In seven African countries, literacy among

young adult women (aged 15–24) has been measured directly by asking respondents to read a whole sentence out loud as part of an interview process.[x]These data, presented in Figure 8, measure variations in an indicator capturing a minimal level of literacy among women who dropped out of school prior to primary completion according to grade attained.[xi] Levels of literacy vary dramatically across this set of countries by grade but typically fall well below 50 percent among those dropping out before the completion of grade four. As success in primary school requires literacy, those who fall behind during the first few grades are more likely to become discouraged and dropout. Given that the poor have much higher attrition rates than the wealthy, it is likely that this is partially due to poorer school performance.

[Figure 8]

However, if we compare cross-country differences in retained literacy at grade 5 according to PPP GNI per capita, we can see that countries with similar levels of income have achieved widely varying basic learning outcomes in primary school (Figure 9). While no more than 20 percent of young women in Zambia who left school at grade 5 can read a simple sentence, 80 percent can read a simple sentence in Malawi and 90 percent in Rwanda and Ethiopia. Thus relatively equally poor countries appear to be achieving widely varying learning outcomes in primary school.

[Figure 9]

Within country wealth inequalities in primary school completion

While UNESCO data do not allow us to explore differential primary completion rates by many subgroups of interest, the DHS data provide an opportunity to illustrate differentials in educational achievement by many subcategories, including urban/rural, ethnicity, religion, language group. Here we focus on household wealth status.[xii] Although direct measures of household income and consumption patterns are not available in the DHS or MICS-2, proxy measures of living standards can be generated at the household level by making use of data collected on households' ownership of a selection of consumer durables and series of housing quality indicators.

There has been a substantial debate about how proxy measures of living standards can be generated from the set of variables typically available in household surveys (Filmer and Pritchett 1999, 2001; Montgomery, Gragnolati, Burke, and Pareses 2000; Sahn and Stifel 2000; Bollen, Glanville, and Stecklow 2002). Broadly speaking, there are three sets of variables available in the DHS, MICS-2 surveys that can be used for generating a proxy measure of household wealth: (1) a set of household durables, including the ownership of a radio, refrigerator, bicycle, motorcycle or car; (2) various indicators of housing quality, including whether the household has finished floors and the number of rooms that are used for sleeping; and (3) access to public services, including electricity, sanitation and piped drinking water.

Although Filmer and Pritchett (1999) and Sahn and Stifel (2000) use all three sets of indicators to generate their living standards measure, the proxy measure generated from the DHS surveys is restricted to the first two sets only.[xiii] We choose this approach for two reasons. First, service

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availability is a resource typically provided by the locality or municipality and therefore is not directly determined by the wealth of the household.[xiv] Second, access to various services can have direct effects on educational attainment that are not attributable to household wealth and should not be confused with the effects of wealth on educational attainment.[xv]

It should also be noted that we lump together urban and rural areas when calculating our proxy measure of living standards. In doing so, we may not capture all the subtleties of urban/rural wealth differences attributable to different consumption patterns and prices. For the purposes of this paper, however, such an approach allows us to explore, on a country-wide basis, the association between wealth and primary completion.

An additional concern with generating a proxy measure of household living standards is how best to combine multiple items to create a single index. Sahn and Stifel (2000) choose the statistical tool of confirmatory factor analysis to develop their indicator of living standards and argue that such methods—relative to the principal components approach used by Filmer and Pritchett (1999)—are better grounded statistically and theoretically. However, in practice, few empirical differences have been found between these alternative approaches to generating a living standards index (Hewett and Montgomery 2001). Thus, we choose to use the principal components technique, which is more commonly used and computationally simpler.[xvi]

After dividing the principal components index into quintiles, we define the "poor" as those residing in households in the bottom two quintiles (or 40 percent) and the "best off" as those residing in households in the top quintile (or 20 percent).[xvii] Thus we have constructed a relative measure of wealth within each country that is not comparable except in relative terms across countries.

Figures 10a and b contrast the levels of primary school completion achieved by the "poorest" to levels achieved by the "best off" for the age group 20–24 for boys and girls separately. Countries are ordered from low to high according to the completion rates of boys residing in the "best off" households. Even among the "best off," completion rates vary enormously from about 40 to 90 percent for boys and 30 to 90 percent for girls. As is clear in Figure 10, in no country has universal primary schooling been achieved for the "poor." South Africa and Zimbabwe come closest with over 80 percent of "poor" girls completing primary in South Africa and over 80 percent of "poor" boys completing primary in Zimbabwe. Only in the best nine performing countries do completion rates for "poor" boys exceed 50 percent. "Poor" girls in the same set of countries have completion rates ranging from 25 to 80 percent. In all other countries, completion rates for "poor" girls fall below 30 percent. The data used to construct Figure 10 is provided in appendix.

[Figure 10]

Contrasts between the "best off" and "poorest" are stark in nearly all countries both for boys and girls. Zimbabwe and Tanzania stand out as having relatively small wealth gaps, particularly for boys. As a next step in the analysis, we developed an index of educational inequality by household wealth, in order to compare the extent of the poverty disadvantage for boys and girls separately. The inequality index is calculated as one minus the ratio of the percent completing

primary of the poorest 40 percent of households, relative to the best off 20 percent of households. This measure of educational inequality ranges from zero to one, with zero representing complete parity of attainment between the best off 20 percent and the poorest 40 percent in a given country and one indicating a complete lack of educational opportunities for the poor. A measure of 0.5 implies that the poor have reached 50 percent of the levels of attainment of the best off.[xviii]

[Table 3]

Table 3 presents the inequality index for primary school completion by wealth status for boys and girls separately as well as the gender gap in the inequality index. The 30 countries listed are ordered from high to low inequality using the index for boys as the baseline. Indices exceed 0.50 in eighteen of the countries for boys, and twenty three countries for girls, attesting to the wide differentials in primary school completion by household economic status. In all but four countries, the index of inequality is substantially higher for girls than boys, supporting the widely held belief that gender inequalities in primary school completion are magnified among the "poor." Differences of 10 percentage points or more in the index between boys and girls can be found in 23 of the 30 countries. Such gender differences tend to be greatest in countries where overall wealth inequalities in primary completion are greatest. It is interesting to note, however, that this pattern is not universal. In four countries – Lesotho, South Africa, Swaziland, and Cote d'Ivoire - inequalities for boys are greater than those for girls. In Lesotho, there is significantly greater inequality among boys than girls. This effect is due to differentials in primary completion, with poor Lesotho girls attaining 30% higher completion rates than poor boys, an unusual pattern for sub-Saharan Africa. These large schooling differentials by gender in Lesotho are also observed in Bruns et. al 2003, which utilizes an alternative method for calculating primary completion rates.

The results in Table 3 strongly support the case for developing indicators to monitor educational progress that can be differentiated by wealth status. They also suggest that further efforts to close the gender gap should focus particularly on the poorest households, whose lack of access and/or lack of success in primary school seems to exceed what might be expected on the basis of differences in household wealth alone, suggesting consideration of additional factors including discrimination and corruption which together can limit the horizons of the disadvantaged.

Why are some poor countries doing so much better than others?

Young men and women aged 20–24 in the late 1990s and the early 2000s would have been entering school in Africa during the 1980s, prior to many of the recent school reforms and universal schooling policies. Those aged 40–44 would have been entering school in the 1960s when many of these countries were just emerging from colonial rule. Thus, some of the determinants of the cross-country inequalities as well as the within-country inequalities by gender and wealth observed in this paper lie in the past and could include a range of social, cultural, political, institutional, and economic factors.

One of the most important determinants of a child's schooling level is the schooling of his/her parents (see NRC/IOM 2005 for a review). As we can see in Figure 11, there are strong positive correlations for both boys and girls between the primary completion rates of those aged 40-44

and those aged 20-24. Thus, it is clear that differential investments in education by former colonial powers are still having an impact on the cross-country inequalities we are observing among young people today. In earlier work, the authors found that countries with an Anglophone tradition had achieved higher levels of grade attainment than countries with other colonial traditions. While the British were committed to some education for all, other colonial powers, including France, Portugal and Belgium, were not committed to universal schooling and only invested in education for a small elite needed to serve their administrative needs (Lloyd, Kaufman and Hewett 1999).

[Figure 11]

We can see in Figure 11 that countries which started at low levels of primary completion have remained at relatively low levels of primary completion, with the notable exception of the small island nation of Comoros. Among countries that had achieved higher rates of primary completion early in their independence, there is a great range of trends over the past 20 years with some countries having achieved much more impressive gains than others. This is particularly true for girls.

These differences are likely to be explained by a range of other factors which we invite the students in the class to explore with available data. Students are also invited to explore factors associated with cross-country differences in gender gaps as well as cross-country differences in within-country wealth inequalities.

Conclusions and Implications

The paper has illustrated that primary completion rates in most countries of Africa remain far below levels required to achieve the Millennium Development Goals of universal primary completion by 2015. Although girls' rates of completion have increased in the past few decades, African boys have not seen meaningful progress in attainment for over twenty years. If increased enrollments and the movement toward universal access to primary education are going to have an impact on the attainment of a basic level of education and acquisition of fundamental competencies, a greater understanding of educational trends and patterns in Africa is required.

In what is only a preliminary exploration of available data, cross-country differences in primary school completion rates, learning outcomes, gender gaps and relative wealth gaps within Africa are not fully explained by cross-country differences in national income per capita. As was observed, very poor countries have been able to achieve relatively high primary completion rates and/or low gender gaps despite relatively low levels of economic development, as conventionally measured. This achievement is also reflected, for some countries, in higher levels of literacy.

While the roots of these differences lie in the past, with differential investments made by former colonial powers, it is clear from these data that much can be accomplished even in the very poorest settings when external resources supplement strong leadership and substantial country commitments to education. External resources will continue to make a difference in a continent that remains extremely poor while experiencing very rapid population growth rates, particularly

in the school-going ages. The effects of recent school reforms, including the waving of primary school fees, will only be seen in primary completion rates achieved at the end of this decade. We predict that those countries that have been able to maintain school quality in the face of a massive rise in enrollment, often with substantial help from the donor community, will be much more likely than others to achieve the millennium development goal of universal primary completion.

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        https://publications.worldbank.org/WDI/

Table 1 Selected sub-Saharan African countries participating in the Demographic and Health Surveys (DHS) or Multiple Indicator Cluster Survey (MICS) since 1997

Country	Year of most recent DHS/ MICS-2 Survey	UN estimated population aged 10-24 as of 2005 (in thousands)	PPP Gross National Income per capita[a]
Benin	2001	2,805	650
Burkina Faso	1998-99	4,616	620
Cameroon	1998	5,975	1840
Central African Republic	2000[a]	1,387	980
Chad	2000[a]	3,252	610
Comoros	2000[a]	263	1410
Côte d'Ivoire	1998-99	6,422	1190
Dem. Republic of Congo	2001[b]	18,985	1150
Ethiopia	1999	25,965	660
Gambia	1999-00[b]	487	990
Ghana	1998-99	7,469	1050
Guinea	1999	2,874	1120
Guinea Bissau	2000[b]	499	640
Kenya	1998	12,217	640
Lesotho	2000[b]	723	2250
Madagascar	1997	5,974	650
Malawi	2000	4,354	380
Mali	2001	3,903	490
Mozambique	1997	6,564	350
Niger	1998	3,987	620
Nigeria	1999	46,777	480
Rwanda	2000	3,488	810
Senegal	2000[b]	3,887	990
South Africa	1998-00	14,597	6300
Swaziland	1999-00[b]	426	2400
Tanzania	1999	12,610	360
Togo	1998	2,056	1040
Uganda	2000-01	9,825	550
Zambia	2001-02	3,929	610
Zimbabwe	1999	5,020	1750

Sources: DHS, MICS-2 data, United Nations population estimates (2006 revision). World Bank, World Development Indicators (WDI)

[a] The GNI PPP data were matched with the survey data by taking the year of GNI data closest to the year of expected primary completion for 20-24 year olds in the DHS/MICS data (see figure 5). If the GNI data were missing for the particular year, the nearest observation within +/- 5 years was used.

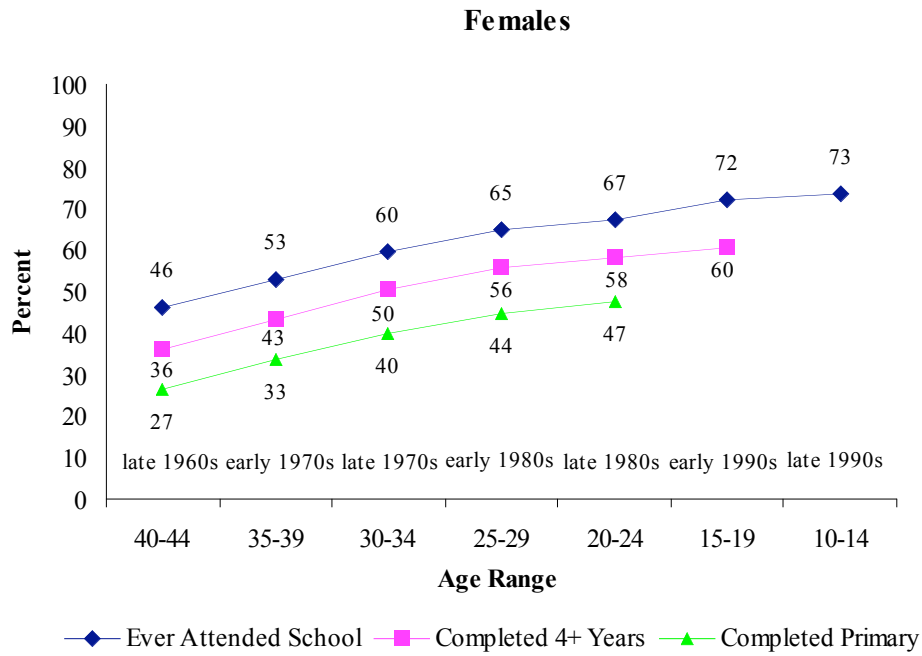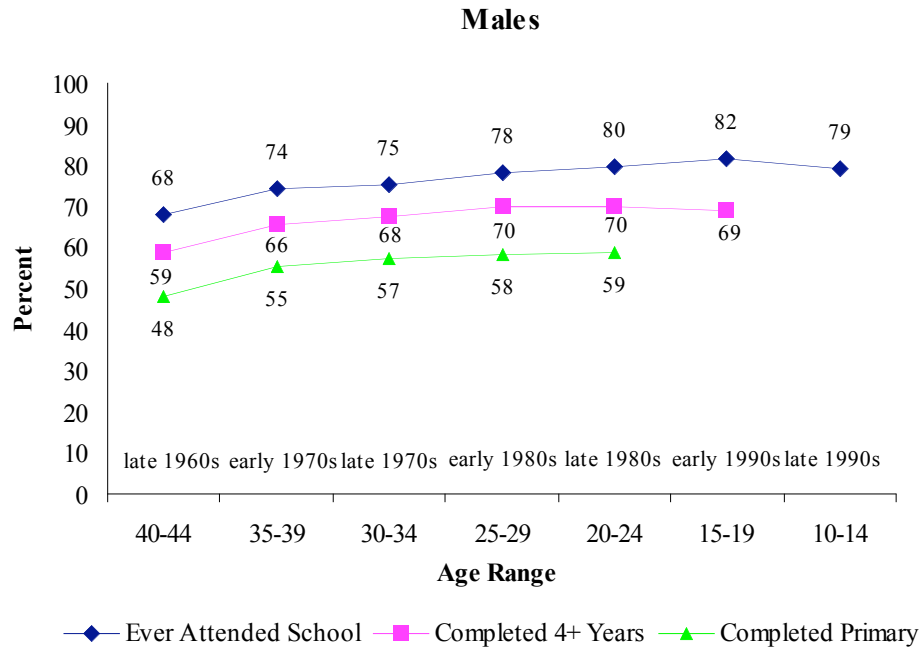[b] UNESCO Multiple Indicator Cluster Survey (MICS-2)

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Figure 1 – Primary completion ratios for progress of boys and girls combined by region, 1990–2000, population weighted
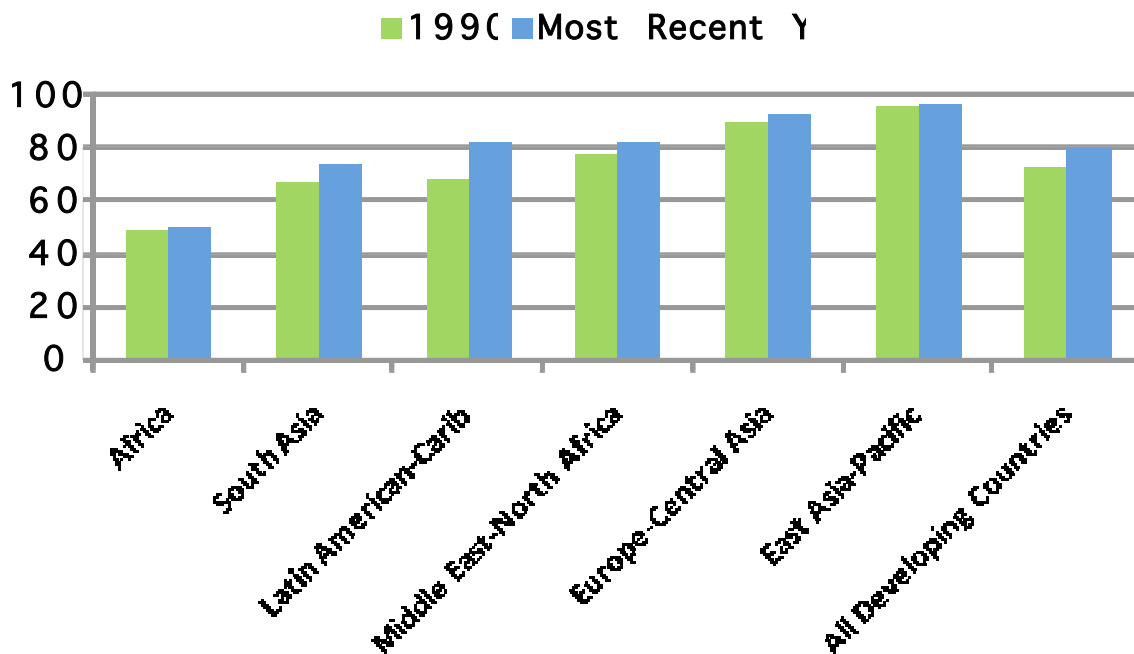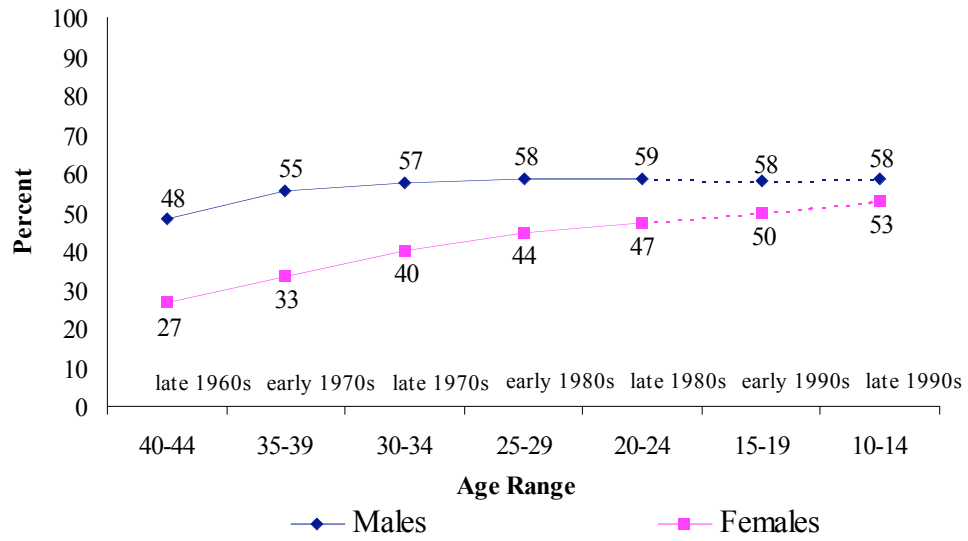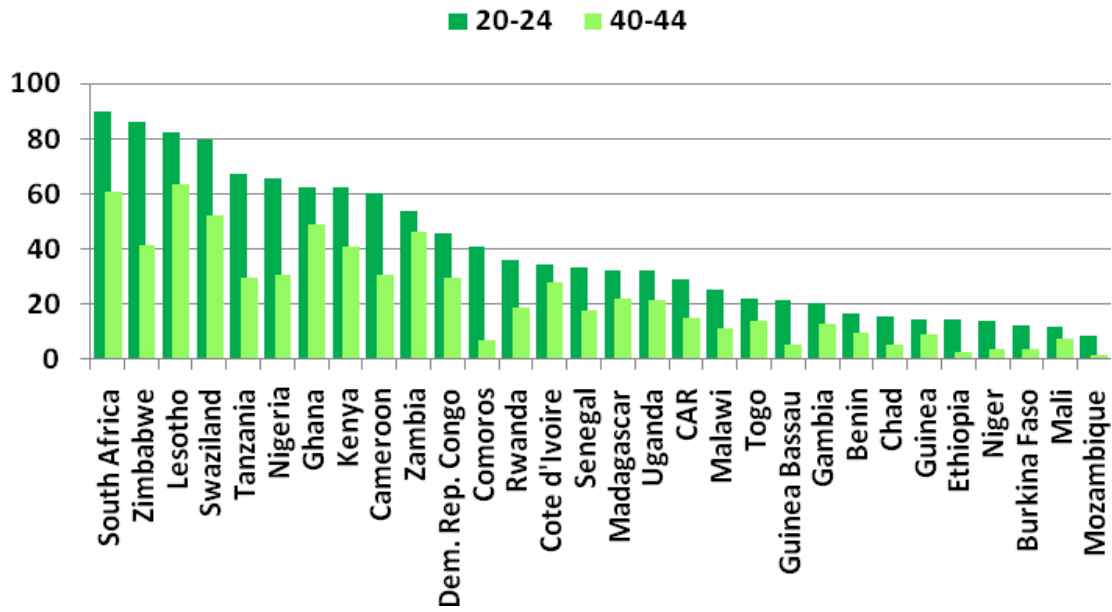

Source: Bruns et al. 2003

Figure 2 Trends in Educational Attainment and Participation in Africa
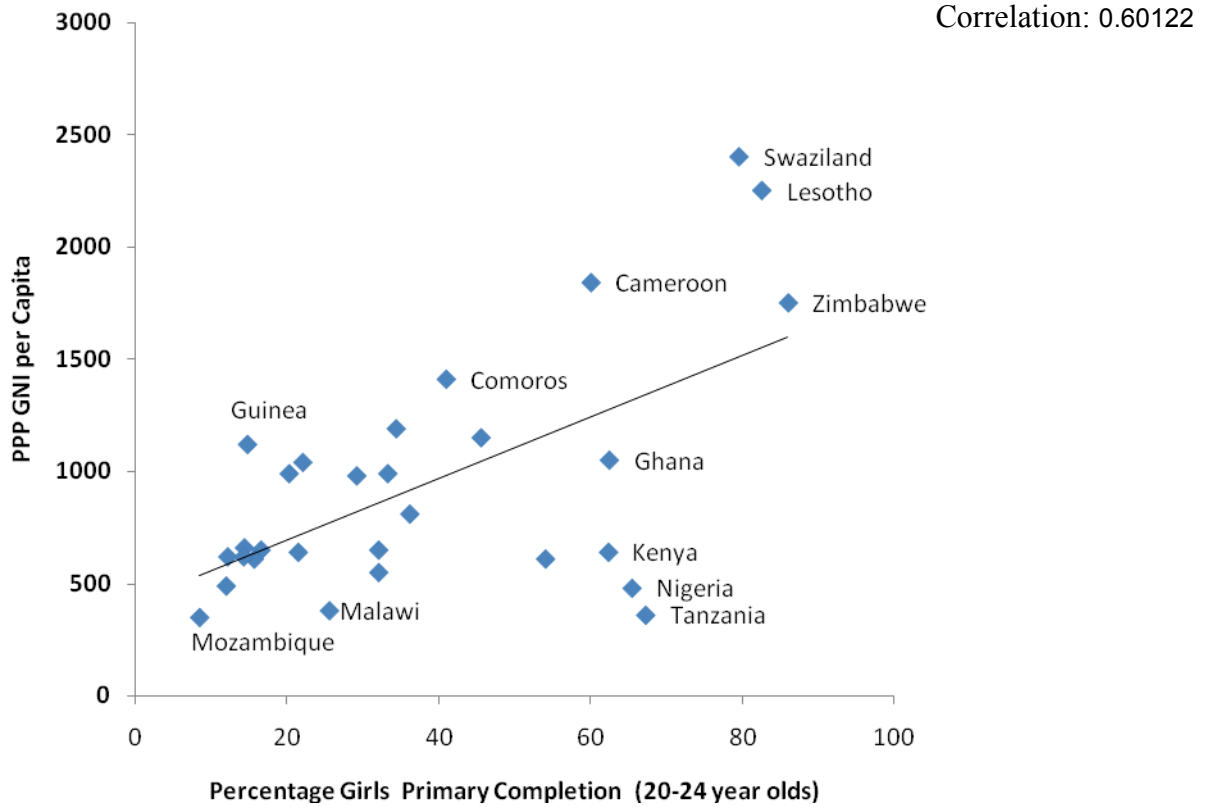(Population Weighted)

Males

Females

Figure
Figure 2 Trends in Completion of Primary - 30 African Countries
(Population Weighted)

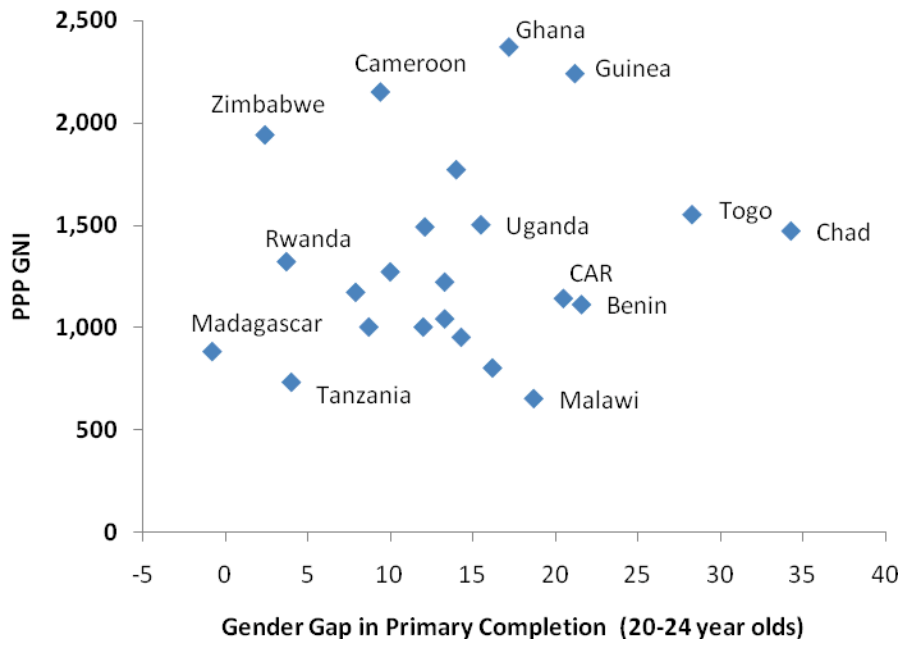**Figure 4** Trends in girls' primary completion rates for those 20 – 24 and 40 – 44 ranked from high to low, by country

**Figure 5** Variation in girls' primary completion against PPPGNI per capita

Correlation: 0.60122

Note: South Africa excluded, PPP GNI per capita of 6300.

Figure 6 Scatter plot: Gender Gap against PPPGNI per capita
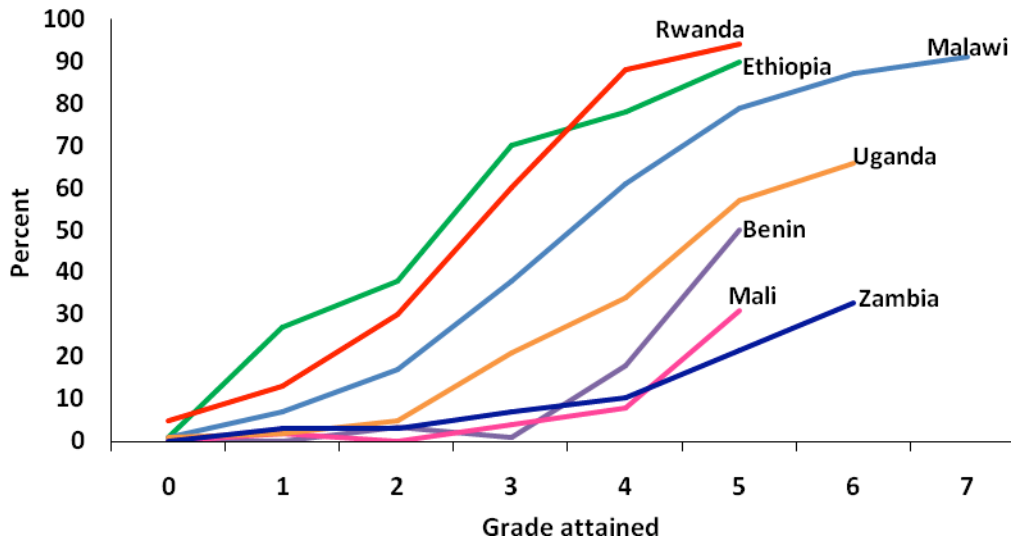

Note: South Africa excluded, PPP GNI per capita of 6300.

Figure 7 Trends in percentage point gender gap, primary completion rates, by country (from hi to low completion rates by girls 20-24 in Figure 4)
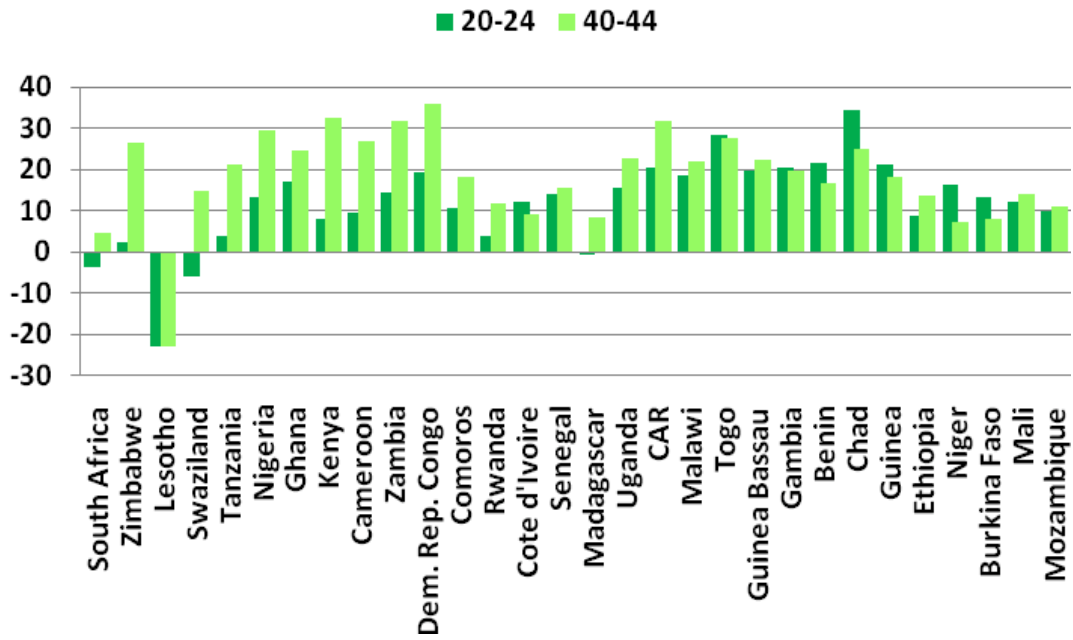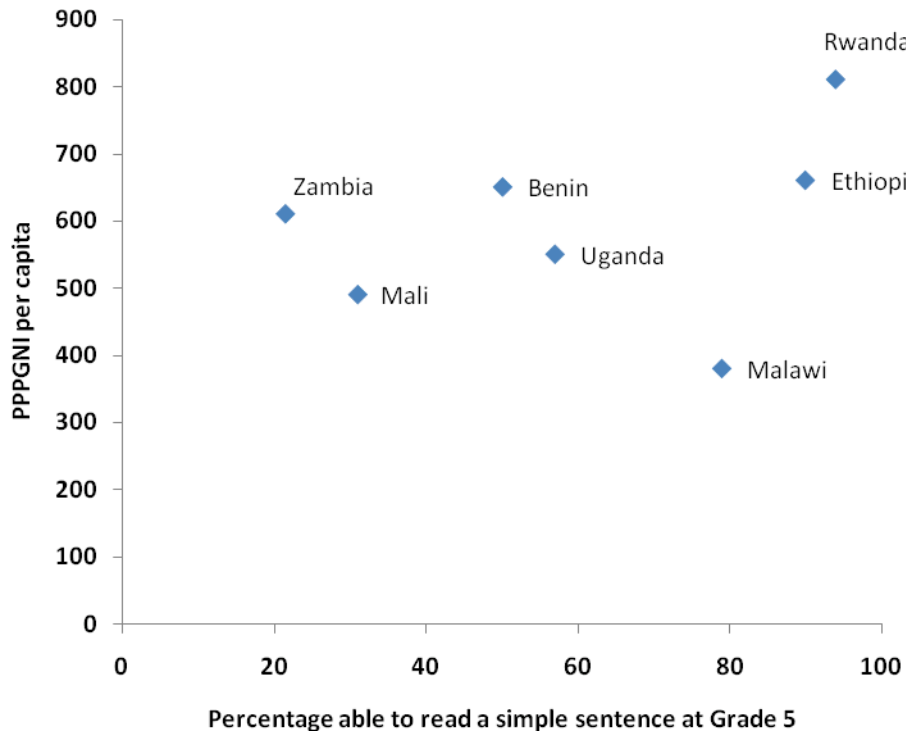
Figure 8. Percent young women 15-24 who can read a simple sentence, by grade attained
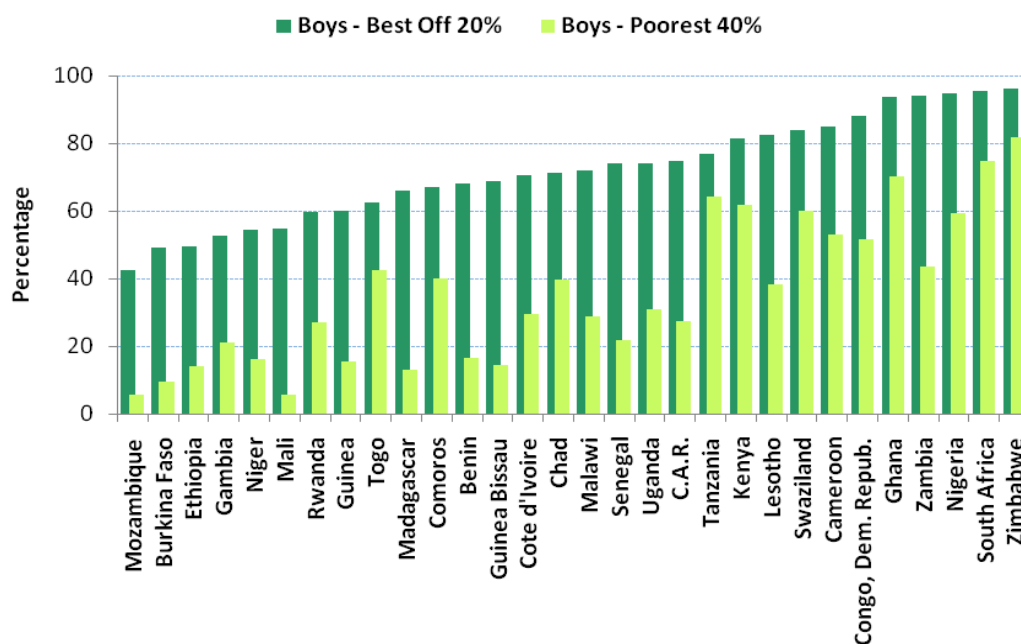

Lloyd and Hewett (2004)

Figure 9   Scatter plot – Percent reading a simple sentence at grade 5 relative to PPPGNI per capita
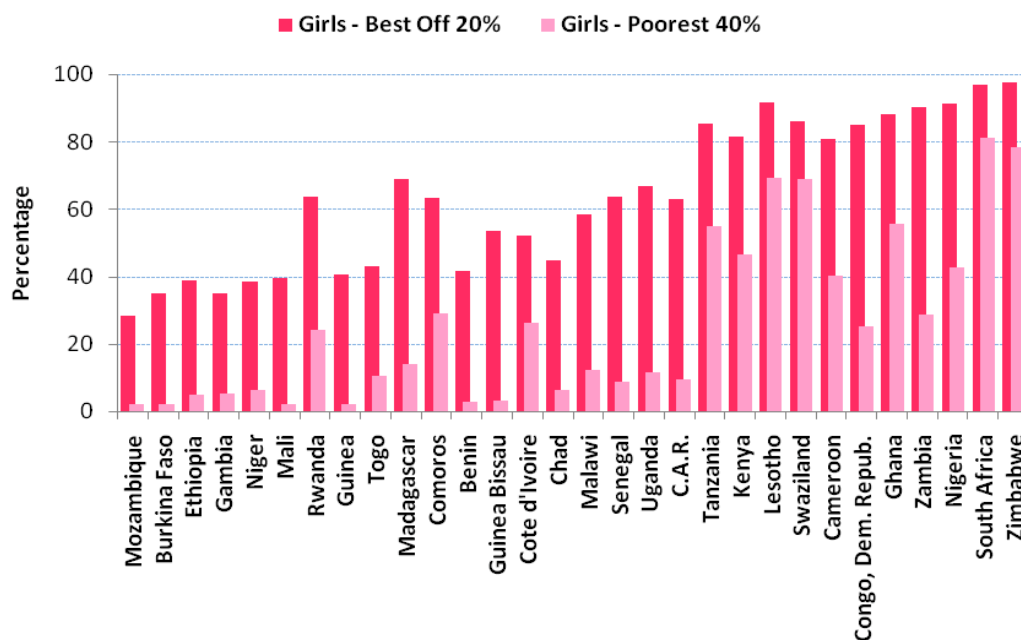

Lloyd and Hewett (2004)

Figure 10a Primary completion percentage – males 20-24 years old, by socioeconomic status
(both figures on this page are sorted low to high by Boys "best off")

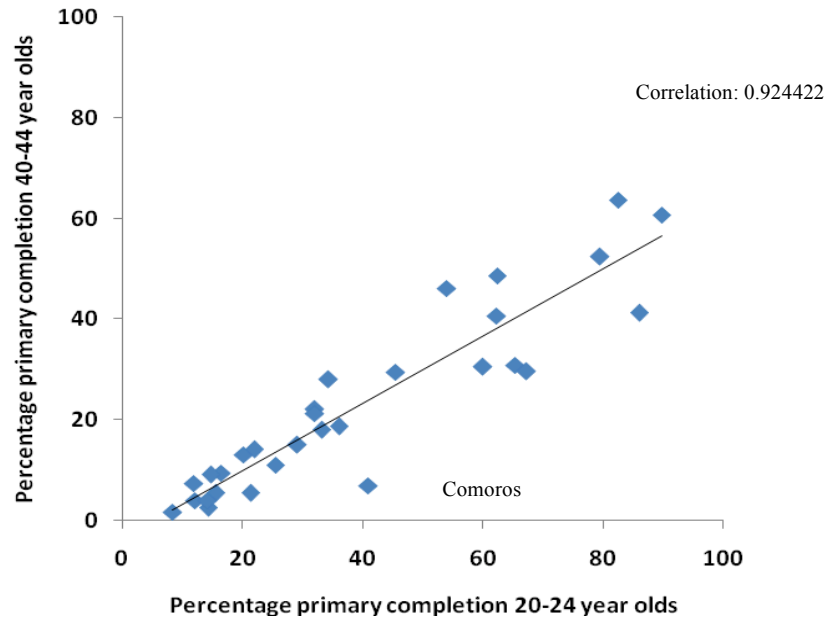Source: DHS and MICS2 data

Figure 10b Primary completion percentage – females 20-24 years old, by socioeconomic status
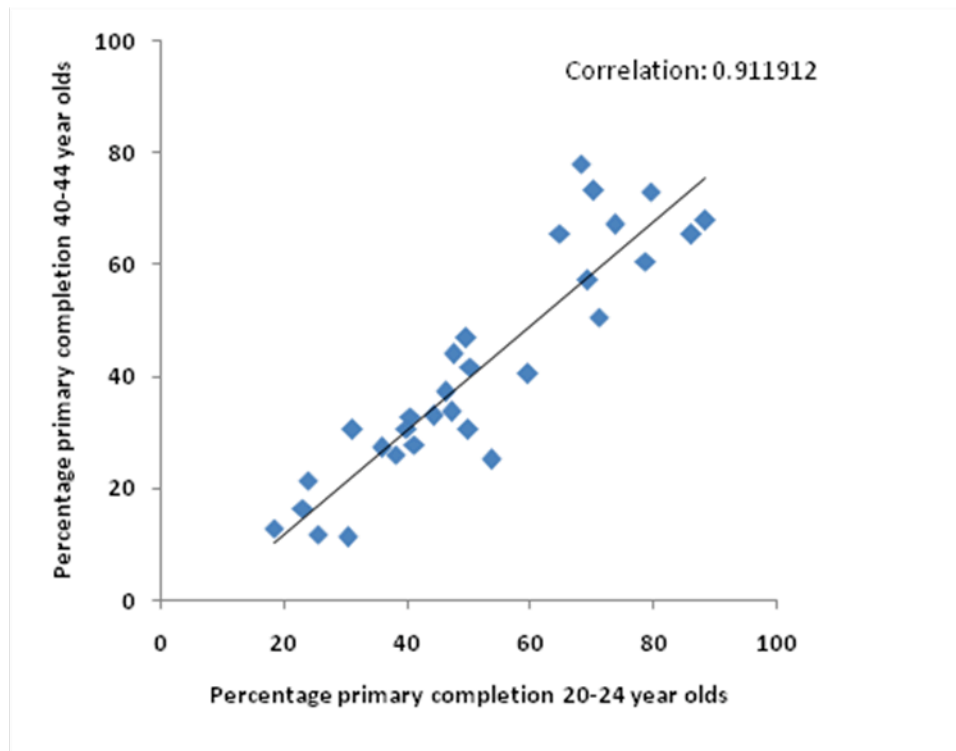

Source: DHS and MICS2 data

Figure 11a Percentage of girls who completed primary; 20-24 year olds relative to 40-44 year olds

Figure 11b Percentage of boys who completed primary; 20-24 year olds relative to 40-44 year olds

Source: DHS and MICS data (Table 2)

Table 3 Index of inequality in primary completion for 20–24-year-olds, by household wealth

Country	Boys	Girls	Gender gap[a]
Mali	0.90	0.94	-0.04
Mozambique	0.86	0.92	-0.06
Madagascar	0.80	0.80	0.00
Burkina Faso	0.79	0.95	-0.16
Guinea Bissau	0.79	0.94	-0.15
Benin	0.76	0.93	-0.17
Guinea	0.75	0.95	-0.20
Senegal	0.71	0.86	-0.15
Niger	0.69	0.84	-0.15
Ethiopia	0.68	0.82	-0.14
Central African Republic	0.63	0.85	-0.22
Malawi	0.61	0.80	-0.19
Gambia	0.60	0.85	-0.25
Uganda	0.59	0.82	-0.23
Côte d'Ivoire	0.58	0.50	0.08
Lesotho	0.54	0.24	0.30
Zambia	0.54	0.68	-0.14
Rwanda	0.53	0.62	-0.09
Chad	0.44	0.86	-0.42
Democratic Rep. Congo	0.41	0.70	-0.29
Comoros	0.40	0.54	-0.14
Cameroon	0.37	0.50	-0.13
Nigeria	0.37	0.53	-0.16
Togo	0.33	0.76	-0.43
Swaziland	0.30	0.17	0.12
Ghana	0.25	0.37	-0.12
Kenya	0.25	0.44	-0.19
Tanzania	0.22	0.35	-0.13
South Africa	0.22	0.16	0.06
Zimbabwe	0.15	0.20	-0.05

[a] Calculated as males minus females.

Note: Countries are listed in descending order by index value for boys. For a description of the index see text. Shaded areas represent countries with inequality index ≥50%.
Source: DHS data.

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Appendix Table Primary completion percentage, boys and girls, by country and socioeconomic status

Country	Boys - Best Off 20%	Boys - Poorest 40%	Girls - Best Off 20%	Girls - Poorest 40%
Benin	68.3	16.5	41.7	3.0
Burkina Faso	49.2	9.6	35.2	2.1
C.A.R.	75.0	27.5	63.0	9.4
Cameroon	85.1	53.0	81.0	40.3
Chad	71.2	39.6	44.9	6.2
Comoros	67.0	40.1	63.2	29.0
Congo, Dem. Rep.	88.1	51.7	85.0	25.4
Cote d'Ivoire	70.7	29.6	52.2	26.3
Ethiopia	49.6	13.9	38.8	5.1
Gambia	52.6	21.0	35.0	5.3
Ghana	94.0	70.1	88.2	55.6
Guinea	60.2	15.4	40.5	2.0
Guinea Bissau	68.8	14.5	53.7	3.3
Kenya	81.4	61.7	81.7	46.7
Lesotho	82.7	38.3	91.6	69.3
Madagascar	66.1	13.0	69.0	13.9
Malawi	72.1	29.0	58.5	12.3
Mali	54.7	5.7	39.7	2.3
Mozambique	42.6	5.7	28.3	2.2
Niger	54.6	16.2	38.6	6.4
Nigeria	94.7	59.5	91.3	42.6
Rwanda	59.8	27.1	63.6	24.2
Senegal	74.1	21.7	63.8	8.8
South Africa	95.4	74.7	97.1	81.4
Swaziland	84.0	60.2	86.2	68.8
Tanzania	77.0	64.2	85.6	55.1
Togo	62.7	42.7	43.1	10.5
Uganda	74.2	30.8	66.9	11.7
Zambia	94.1	43.7	90.5	28.7
Zimbabwe	96.3	81.9	97.7	78.4

Source: DHS and MICS2 data

Notes

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[i] These estimates represent regional averages that are population-weighted and are calculated as the ratio between the total number of students successfully completing (or graduating from) the last year of primary school in a given year, and the estimated number of children of official graduation age in the population in that year, based on recommended starting ages and the number of years in the primary school cycle. We use the term "ratio" rather than the term "rate" used by the authors because the numerator and the denominator of the estimate are not derived from the same population base

[ii] Information on the educational participation and attainment of household members are provided by an informed adult, typically the household head. Attainment rates are derived from two questions – whether the household member had ever attended school and the highest grade completed. Attendance rates are captured from the question on whether the household member "is currently attending school." While the MICS surveys have an additional question on attendance for those who were not reported to be currently attending, specifically, whether the household member had attended "at any time during the current school year," we did not utilize this question to supplement the estimates of attendance so as to keep the derivation of the attendance rates comparable across the DHS and MICS surveys.

[iii] Differences in mortality by education can bias estimates of trends. It is typically expected that the more educated have lower mortality rates. Thus, we would assume that estimates of primary completion rates among older cohorts will be biased upward because of the lower mortality of the more educated, while estimates of current cohorts will be measured more accurately. The result would be that rates of educational progress relative to the past will be underestimated. In the context of AIDS, however, educational differentials in mortality may have shifted in Africa. We are unaware of recent estimates of mortality by education and therefore cannot assess the extent of the bias or how it might be changing.

[iv] We chose five-year age cohorts to smooth out variations from smaller sample sizes at individual ages, as well as to account for potential age misreporting in the DHS data.

[v] For simplicity, the same population weights are applied for each age group.

[vi] For estimates to be representative of the whole region, the 9 percent of the sub-Saharan population that is not represented by DHS data should have similar average levels of schooling participation and attainment as the 91 percent of the population represented. If this is not the case, our estimates will be biased. Given that much of the missing population lives in countries that are in the midst of armed conflict and civil disruption, our estimates may be slightly too high for the region as a whole. There is more recent data available from the DHS for many of these countries that will be used to update the analyses in future drafts of the paper.

[vii] The length of the primary school cycles varies across our sample of countries from five to eight years. The estimates of primary completion rates for the region as a whole are based on the actual years required in each country. Since the Millennium Development Declaration made no recommendation about the desirable length of the primary school cycle and based the second MDG on the current lengths of existing national cycles, we feel it is preferable to use country-specific measures to calculate regional averages.

[viii] The weights for each observed data point were created by fixing three algebraic

conditions: (1) a constant increment between weights (2) a greater weight for younger cohorts and (3) an average of the weights equal to one. Thus, the weights for primary school completion were: .33 .67, 1.0, 1.33, and 1.67; for grade four completion they were: .29, .57, .86, 1.14, 1.43, and 1.71.

[ix] The typical literacy data reported by UNESCO is based on self-reports.

[x] The interviewer has several simple sentences printed on cards that are chosen at random for each interview (in the language spoken locally). The four sentences used in the Uganda survey are as follows: (1) "Breast milk is good for babies," (2) "Most Ugandans live in village," (3) "Immunization can prevent children from getting diseases," (4) "Family planning teaches people to be responsible for their family."

[xi] The line for each country terminates the year before the last year of primary. This is because, the successful completion of primary is often predicated on success in the national exam and therefore we would expect literacy rates to jump to 100 percent in the last year of primary because of the selectivity of the sample from that point on.

[xii] The household survey provides a nationally representative sample of each age group. With advancing age, however, there is an increasing likelihood that an individual's household of residence is no longer their natal household. Thus, by linking a household wealth indicator with the percent completing primary, we are assuming that , for those who no longer live in their natal home, there is a strong correlation between the relative wealth status of the parental home and the relative wealth status of the current household of residence. Given that household wealth categories divide the population into only three broad groups, this assumption is likely to be reasonable. Because of this concern, however, we do not look at wealth differentials for those over the ages of 20-24.

[xiii] For the smaller number of MICS-2 countries we utilized the living standards index included in the data files. This measure utilizes all three categories of indicators and parallels the Filmer and Pritchett approach. Although constructed differently, the two indices are highly correlated.

[xiv] Thus, including service availability indicators in the calculation of living standards lends too much weight to these items for urban households, giving them an undue resource advantage.

[xv] For example, electricity makes it easier to read and write and complete educational requirements; high quality sanitation and access to safe water reduces the occurrence of sickness and disease, allowing more time for attending and completing school work. Because such variables can also increase the economic productivity of the household, if access to services were included in the generation of a proxy measure of wealth, the direct effect of these indicators would be captured, leading to an overestimate of the role of living standards on educational achievement.

[xvi] For the mathematical and statistical derivation of the principal components school, see Hewett and Montgomery 2001.

[xvii] This follows the procedure used by Filmer and Pritchett (1999, 2001).

[xviii] The reader should keep in mind that two countries with similar absolute gaps between groups can have different ratios because the ratio is constructed relative to the attendance rate of the more advantaged group. In countries where the most advantaged group has reached high levels of attendance, the variation in the ratio from zero to one represents a much wider range of performance for the less advantaged group than in countries where the most advantaged group is also performing poorly.