Introduction

Each year since 2009, Uwezo has undertaken a large scale survey of children and schools throughout Kenya, as well as in Uganda and mainland Tanzania. The objective of these surveys is to provide an independent assessment of the extent to which children aged 6 to 16 years are actually learning, as well as to collect data about the characteristics of government primary schools across the country. Both country-specific and regional reports of these learning outcomes are now available; however, there has been only limited analysis of the conditions in which children are learning. This policy brief aims to bridge that gap and focuses on the characteristics of government primary schools across Kenya.

A key advantage of the Uwezo survey data is that it is representative at the district level. In the case of Kenya in 2011 (being the second round of the survey, thereby called ‘Uwezo 2’), 122 districts out of 158 were covered (following the 2009 national census framework). This report is based on data gathered during visits by survey teams to nearly 3,500 individual government primary schools. The villages where these schools are located were randomly chosen within the districts. Table 1, below, summarises the coverage of the Kenyan Uwezo 2 survey data.
A main finding of the Uwezo surveys is the chronic deficiency in learning outcomes across the country. For instance, less than one out of three Kenyan children enrolled in Standard 3 are able to pass both English and Numeracy tests set at the Standard 2 level; and less than half of all pupils in Standard 4 can also pass both tests. Many factors explain differences in learning outcomes, and school inputs are just one of them. Even so, understanding how school inputs vary across the country is important, not least from the perspective of verifying how tax-payers resources are being allocated and spent.

To summarise the main results, the Uwezo 2 profile of Kenyan public primary schools is presented based upon SEVEN key findings (stylized facts). These are set out in turn below, followed by a short conclusion.

Table 1: Coverage of the Uwezo survey data for Kenya, 2011

<table>
<thead>
<tr>
<th>NUMBER OF UNITS SAMPLED</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Districts</td>
<td>122</td>
</tr>
<tr>
<td>Schools</td>
<td>3,474</td>
</tr>
<tr>
<td>Villages</td>
<td>3,628</td>
</tr>
<tr>
<td>Households</td>
<td>55,843</td>
</tr>
<tr>
<td>Children</td>
<td>131,197</td>
</tr>
</tbody>
</table>

Source: authors’ calculations from Uwezo 2 data.

Even in Standard 7, almost one in ten children cannot pass both the English and Numeracy tests at class 2 level. Thus, there is clear scope to improve learning outcomes throughout primary school.
Seven Facts about Learning in a Kenyan Public Primary School

FACT 1: Learning outcomes are low.

The Uwezo surveys are representative both of children enrolled in primary school and of children that either have never enrolled or have dropped out. As part of the surveys, a short set of tests is administered to each child in each surveyed household to assess their literacy and numeracy competences. The tests are based on the Standard 2 curriculum, and therefore reflect only basic competencies. A principal finding is that many children of primary school age, including those enrolled beyond Standard 3, are not able to pass the tests. This is illustrated in Figure 1, which shows the pass rates for children enrolled at school at different grades on the individual English, Kiswahili and Numeracy tests, as well as the combined pass rate on the English and Numeracy tests. On all of the individual tests, only around one in three children enrolled in Standard 3 can pass them. This rises to a little over 60% (or less than two in three children) in Standard 4. Even in Standard 7, almost one in ten children cannot pass both the English and Numeracy tests at class 2 level. Thus, there is clear scope to improve learning outcomes throughout primary school.

Figure 1: Test score pass rates (Std. 2) by Standard (3 to 7)

Source: authors’ calculations from Uwezo 2 data.
FACT 2: The average public primary school has around 450 enrolled pupils.

The size of a primary school, as measured by the number of formally enrolled pupils, provides a first indication of pressure on school resources, and in particular the potential for teachers to get to know and provide due attention to individual pupils. Figure 2 describes the size distribution of government primary schools in Kenya, as per the Uwezo 2 data described previously. It shows the fraction of schools that fall into the different size categories defined by the individual slices (e.g., 0-200, 200-400, 400-600 pupils etc.). The chart shows that a little less than 50% of schools contain up to 400 pupils. However, there are also a significant number of large schools – around 12% of schools contain over 800 pupils, of which a small share (6%) contain more than 1000 pupils.

As is to be expected, larger primary schools tend to be found in higher density urban areas. In such areas the average school size is over 500 enrolled pupils. Relatedly, there is a regional pattern to school sizes. Specifically, approximately 25% of all schools with over 1000 pupils are located in the Rift Valley province, and a further 20% are found in Western province and Coast province (respectively).

Figure 2: Distribution of Kenyan public primary schools, by size

Notes: School size is measured by the number of pupils formally enrolled, indicated by the category labels by the side of each slice.
Source: authors’ calculations from Uwezo 2 data.
FACT 3: On average, around one in ten enrolled pupils are absent from school at any one time.

Figure 3 classifies Kenyan primary schools according to the share of pupils in attendance (across all classes).\(^1\) More than one quarter of schools show an attendance rate in excess of 95%, while a further quarter has an attendance rate of between 90% and 95%. Thus, in the typical school, around 90% of enrolled pupils are in attendance at any one time, or 45 of 450 pupils are absent. However the figure also indicates there is substantial variation around this average. In particular, there are a significant number of schools (just less than 20%) with rates of attendance below 80%.

The attendance rates of Kenyan pupils do not differ systematically across schools of different sizes (i.e., larger and smaller schools have roughly similar average attendance rates). Even so, there are a number of districts where more than half of all schools have a pupil attendance rate of below 80%. These districts are: Kuria East (Nyanza province), Migori (Nyanza province) and Turkana Central (Rift Valley province).

**Figure 3: Attendance rates of primary school pupils**

\(^1\) These estimates are based on the number of pupils in class observed on the day of the Uwezo survey. The attendance rate is given by the ratio of the observed number of pupils in attendance to the number of pupils enrolled in the school, where the latter is taken from information given by a senior teacher interviewed for the survey. Of course, there may be special cases (such as field trips) that could lead to misleadingly high or low attendance rates. However, these are not expected to be systematic, meaning that the national averages (based on around 3500 schools) are expected to provide a good guide to the actual situation.
...around half of all schools have a teacher absentee rate in excess of 10%, and as many as one in ten schools have a daily teacher attendance rate of less than 70%.

**FACT 4: On average, one in ten teachers are absent from school at any one time.**

Figure 4 shows the fraction of Kenyan government primary schools in different categories of teacher attendance rates. It shows that 38% schools have a teacher absentee rate of less than 5% (95% attendance or more) and a further 13% have an absentee rate of between 10% and 5% (90%-95% attendance). Thus, around half of all schools have a teacher absentee rate in excess of 10%, and as many as one in ten schools have a daily teacher attendance rate of less than 70%. As the typical (i.e., median) government primary school in Kenya has around 11 teachers, this means that in half of all Kenyan schools more than one teacher is absent at any one time, likely leaving pupils unattended and certainly increasing the work burden for those teachers actually present.

There are moderate differences in rates of teacher attendance between schools of different sizes. Smaller schools display slightly higher teacher absentee rates, however this is largely to be expected given the smaller number of teachers in these schools. Also, a number of districts perform particularly poorly as regards teacher attendance. In the following districts more than half of all schools show a teacher absentee rate of over 20%: Kisumu West, Migori, and West Pokot.

**Figure 4: Attendance rates of primary school teachers**

Source: authors’ calculations from Uwezo 2 data.
FACT 5: Two thirds of primary school children are learning in classes with less than 40 pupils per teacher.

Internationally, a ratio of less than about thirty pupils per teacher is recommended in primary schools, while in Kenya, the officially recommended number is 40. As can be seen from Figure 5, which plots the cumulative distribution of the effective pupil-teacher ratio, based on the observed number of students and teachers in school, around one third of Kenyan government primary schools boast an average pupil-teacher ratio of at most thirty, and a further third of schools boast a ratio of between 30 and 40 pupils per teacher. The figure also shows there is substantial variation in the number of pupils to teachers. For instance, around 10% of schools have less than 20 children per teacher (on average); but also 8% of schools have over 60 pupils per teacher and 2% have classes of more than 100 pupils per teacher.

Figure 5: Cumulative distribution (by schools) of the effective number of pupils per teacher in Kenyan primary schools

Notes: Pupils per teacher is the effective number, and takes into account absence of both pupils and teachers; x-axis is based on a logarithmic scale.

Source: authors’ calculations from Uwezo 2 data.

2 The effective pupil-teacher ratio tends to be lower than the formal ratio, which is based on official pupil enrollment and teacher numbers, due to the greater relative number of absent pupils versus absent teachers (see earlier Findings). These pupil-teacher ratios are school averages, based on class-specific observations.
FACT 6: There is a strong association between school characteristics and learning outcomes.

The relationship between school inputs and learning outcomes is a complex and difficult issue where many of the best academics disagree (due to mixed evidence from other countries). It therefore must be appreciated that any finding of an association or correlation between some measure of school inputs and learning outcomes generally should not be interpreted as a causal relationship. The reason for this is that ‘good’ schools are often located in more advantaged areas, and thus are attended by children from better-off and better-educated families. Thus, it is easy to confound the effect of school inputs with these (unobserved) external factors.

Nonetheless, it remains of interest to examine the extent and nature of the relation between school inputs and learning outcomes. This is shown in Figure 6 which plots some selected average school characteristics across quintiles of test scores, based on the tests included in the Uwezo surveys (see Finding 1 above) and where we use the average pass rate on the English and Numeracy test (combined) at the school-level to construct the quintiles. The figure shows that higher test scores (e.g., in quintile 1) are broadly associated with more favourable school inputs. For example, schools in the top quintile have more than 3.1 teachers per hundred pupils (or a pupil-teacher ratio of around 30:1) and a teacher absenteeism rate of less than 8%. In contrast, schools in the bottom quintile have a pupil-teacher ratio approaching 40:1 and a teacher absenteeism rate of over 11%.

Two further comments are in order. First, the difference in these (average) school inputs between the top and bottom test score quintiles are only moderate. With respect to the pupil-teacher ratio, less than ten pupils separate the first and fifth quintiles. This would suggest that many other factors play a role in determining outcomes, not just these inputs. Second, school feeding programmes appear to be quite well-targeted to more challenged school environments – e.g., around one half of schools in the lowest (fifth) quintile report having a feeding programme versus around one third of the best performing schools.

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Figure 6: Indicators of school facilities, by test score quintile

Notes: test score quintiles (y-axis) are based on pupils’ pass rates on the English and numeracy test (combined, as per the Uwezo surveys), and refer only to children enrolled in primary school; the first quintile (“1”) contains the highest pass rates by school, and the fifth quintile (“5”) the lowest.

Source: authors’ calculations from Uwezo 2 data.
FACT 7: Children in arid districts face severe educational challenges.

The Kenyan government recognises the particular learning challenges facing children in the arid districts. Figure 7 compares arid and non-arid districts on a variety of schooling indicators, including inputs and learning outcomes. It shows that rates of pupil and teacher attendance, as well as the number of teachers per pupil are moderately lower in arid districts. Similarly, arid districts have head teachers with almost ten years less experience compared to non-arid districts and more restricted access to clean drinking water. However, critically, overall learning outcomes remain sharply below those of non-arid districts. In arid districts only one in three children enrolled in primary school can pass both the English and Numeracy tests (combined); this compares to around half of pupils in the non-arid districts.

Figure 7: Challenges facing arid districts

Notes: all panels (except panel f) report the median of the indicated variable for all schools in either non-arid or arid districts; the test pass rate (panel a) refers only to enrolled pupils and is the combined pass rate on the English and Numeracy Uwezo tests; panel (f) reports the share of schools with access to clean water.

Source: authors’ calculations from Uwezo 2 data.

3 Districts covered in the Uwezo 2 sample defined as arid are: Lagdera, Ijara, Mandera East, Mandera Central, Mandera West, Wajir North, Wajir East, Wajir West, Marsabit, Moyale, Samburu Central, Samburu North, Samburu East, Turkana Central, Turkana South, West Pokot, Pokot Central, Pokot North, Tana River & Tana Delta.
Conclusion

This policy brief has reported on the prevailing conditions in government primary schools throughout Kenya. Using data covering nearly 3,500 schools, which is representative at the district level, it provides a unique basis on which to evaluate how tax-payers funds are being allocated and used. As an independent survey it goes beyond official government statistics and reports on issues such as the effective attendance of pupils, as well as teacher absenteeism.

The analysis has highlighted the achievements and challenges of the Kenyan public education system. Among the challenges we have highlighted that there are a significant number of schools where class sizes are well in excess of 40 pupils per teacher, and numerous schools where more than two in ten teachers are absent at any one time. Thus, in face of strong demand for primary education, the challenge is how to maintain and improve the quality of learning conditions throughout the country.

One area of particular consideration is the arid districts. Here we tend to find higher rates of absenteeism as well as difficulties in attracting and retaining more experienced head teachers. Nonetheless, it should be recognised that the magnitude of disadvantages facing arid districts with respect to school inputs (e.g., class sizes) is moderate. This is also true more generally when one compares the top and bottom performing schools on the Uwezo tests. Thus, a tentative conclusion is that school inputs can explain only a small part of the deficiencies in learning, either in Kenya as a whole or in the arid districts in particular. Indeed, looking across the extensive academic literature, a broad consensus is that what really matters for learning outcomes are the incentives facing teachers. Effective teaching is possible under the most adverse conditions; and it is this that really needs to be encouraged.

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