Uganda Early Years Study

Milestone 3: Final Report

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Prepared for:
Simon Matinda, Director
James Patrick Ochieng, Team Leader
Victor Simba, Finance and Contracts Specialist
Jennifer Nyakinya, Programme Specialist
Price WaterhouseCoopers Limited
PwC Tower, Waiyaki Way/Chiromo Road, Westlands
PO Box 43963—00100 Nairobi, Kenya

On behalf of:
DFID East African Research Fund (EARF)

Prepared by:

Tara Weatherholt, Rehemah Nabacwa, Luis Crouch, Jennifer Pressley, Rachel Jordan, Henry Healey, Katherine Merseth, and Eileen Dombrowski
RTI International
3040 Cornwallis Road
Post Office Box 12194
Research Triangle Park, NC 27709-2194, USA

Disclaimer

This report represents the study team's understanding of the efficiency of early primary and pre-primary education in Uganda and how this impacts policy and primary education sector spending at the national level and learning level outcomes for all, particularly the poorest populations. The report does not necessarily reflect the views of the Department for International Development or the United Kingdom's Government.

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Abbreviations

DFID	Department for International Development, UK
DOB	date of birth
DRASPAC	Development Research and Social Policy Analysis Centre
EARF	DFID East African Research Hub
ECD	early childhood development
EMIS	education management information system
GER	gross enrolment ratio
GIR	gross intake ratio
GOU	Government of Uganda
LARA	Literacy Achievement and Retention Activity
MoES	Ministry of Education and Sports
N/A	not applicable
NIECD	National Integrated Early Childhood Development Policy
P1–P7	primary 1 through primary 7
RTI	RTI International (registered trademark and trade name of Research Triangle Institute)
SES	socio-economic status
SHRP	School Health and Reading Project
UGX	Ugandan shillings
UIS	UNESCO Institute for Statistics
UNESCO	United Nations Educational, Scientific and Cultural Organization
USAID	United States Agency for International Development

Executive Summary

Global education data suggest that many countries, including Uganda, suffer from an enrolment bulge of pupils in the early grades. The British Department for International Development (DFID) has partnered with the Ugandan Ministry of Education and Sports (MoES) to conduct empirical research on inefficiencies in its education system. This research will help the Ministry better understand the severity, causes, and consequences of an enrolment bulge in early primary classes.

Specifically, this study is investigating the magnitude of repetition in primary 1. A key data source was interviews with the pupils' parents/guardians and teachers. We explored parent/guardian perceptions of educational matters, such as children's age at enrolment; and parent/guardian decisions about pre-primary and primary school. We analysed the efficiency of early primary and enrolment in pre-primary education in Uganda, and considered the implications of inefficiency for primary education sector spending and policy.

This study relied on a nationally representative sample of schools and pupils. Its methodology involved triangulating data from multiple sources, including records from the national education management information system (EMIS), schools, and interviews with teachers and parents/guardians.

Key findings about primary 1 repetition and pre-primary enrolment are:

- Repetition rates were much higher than reported in EMIS and school records. On average, teachers reported a repetition rate of 41% and parents/guardians perceived the repetition rate to be 51%. By contrast, EMIS records reported a repetition rate of 11%.
- Parents/guardians and teachers expected between 20% and 40% of pupils to repeat primary 1 the next year.
- Pupils who did not attend pre-primary were 3.8 times as likely to repeat as pupils who did attend pre-primary – even after controlling for other variables such as socio-economic status and disability.
- Almost 30% of parents/guardians enrolled their child in primary 1 'early' – at the age of 5 or younger – and those children were nearly twice as likely to repeat the grade.
- Parents/guardians reported higher under-age (11%) and over-age (44%) enrolment in primary 1 than school records and EMIS records suggested.
- Parents/guardians were knowledgeable about children's learning, they were proactive in seeking education for their children and they perceived early enrolment as a means to prepare children for completing primary 1.

These surprising findings suggest that **pre-primary schooling 'protects' against repetition.** The government could consider taking advantage of this effect to address over-enrolment, dropout rates, and overall system efficiency. Furthermore, the findings suggest a **high demand from parents for pre-primary education,** for which primary 1 is a poor substitute.

We also undertook a macro-level analysis of factors related to the efficiency of education. In that analysis, countries that were similar to Uganda in various ways displayed similar education efficiency characteristics. Overall, repetition rates were much higher than the official reports;

rates of pre-primary enrolment were very low; and primary school completion rates also were very low. Together, these factors create a very high cost of per-pupil completion in Uganda's and other countries' education systems. By contrast, the neighbouring countries of Kenya and Tanzania were found to have lower over-enrolment in early primary, much higher access to pre-primary, and higher completion rates than Uganda, resulting in higher internal efficiency.

Currently, the Government of Uganda (GOU) is investing an exorbitant amount of money in primary school, which does not translate into efficiency. We used national demographic data to prepare a cost-projection model to determine (1) how much the GOU pays for over-enrolment in primary school and (2) how much the government could save if it were to make calculated investments in education to decrease the repetition rate. **The cost of the inefficiency in 2015 was US$177.1 million, or approximately 43% of the total expenditure on primary education that year.** The model showed that if the GOU were to invest in increasing access to high-quality pre-primary education, and to make corresponding quality improvements in primary education, those investments would have the potential to pay for themselves in 12 years' time.

This study recommends that policy dialogue between the Ugandan Ministry of Education and Sports (MoES) and other stakeholders consider the following:

- ***Invest to improve the quality of primary education as well as to expand high-quality pre-primary.*** Investments might encompass subsidies to private pre-primary providers, more and better books for primary schools, in-service teacher education, teacher support or coaching, improved school management and governance, and systems improvements. These enhancements would reduce repetition rates and raise completion rates, thereby improving sector efficiency.
- ***Revisit the automatic promotion policy.*** The data revealed that current school practice does not adhere to the policy of automatic promotion. As a result, schools are sending inaccurate enrolment and repetition data to the MoES, which then uses the data to make important decisions about education policy. If automatic promotion is to be effective, learning outcomes must improve. That can be accomplished by increasing access to pre-primary education and by improving the quality of instruction in early primary grades.
- ***Set minimum standards of quality and strengthen quality assurance.*** Defining a clear vision and a strong mandate for pre-primary education would create an incentive for quality and intensify the appetite for reform in the education landscape. Cambridge Education (2017) underscored the importance of creating an environment which supports various approaches to high-quality pre-primary education, provided by multiple partners. The GOU could define minimum standards of quality, enhance regulation, and thereby lead all stakeholders interested in early childhood education in the country.
- ***Improve school management and leadership of the early grades.*** Head teachers could prioritize cohesive support to teachers of early primary grades. Head teachers and school staff should recognize the importance of the foundational years in children's later academic achievement.
- ***Prioritize support for vulnerable children.*** This study found that pupils living in poverty were less likely to attend pre-primary, and those with disabilities were more likely to repeat primary 1. Other studies have found that disability impedes access to pre-primary and to other forms of early childhood care (Cambridge Education, 2017).

1. Introduction

1.1 Summary of Conceptual Framework

Uganda introduced Universal Primary Education in 1997. At that point, primary school enrolment exploded – from 2.5 million learners in 1996 to 8.3 million in 2015 (Ministry of Education, Science, Technology and Sports [Uganda], 2015). While access to schooling has increased, there has been less progress in quality and learning outcomes, including completion. For the past 10 years, as measured by gross intake ratio (GIR) to the last grade of primary education, primary school completion rates in Uganda have hovered around 60% (UNESCO Institute for Statistics [UIS], 2015).

Education system efficiency is defined as the relationship between system inputs and outputs: 'A more efficient system is one that achieves more outputs for a given set of resource inputs, or achieves comparable levels of output for fewer inputs, other things equal' (Lockheed & Hanuschek, 1988, p. 5).

Completion rates are one simple measure of efficiency. For an education system to be considered 'efficient', all learners should move through their years of schooling at an appropriate rate – i.e. one year of age to one school year. At the end, they should exit the system with the skills and competencies they need to participate meaningfully in the job market or go on to higher education.

Completion rates are driven by dropout rates which, in turn, are strongly associated with repetition rates. Research in Bangladesh and Mexico found that repetition, low achievement, low attendance and late enrolment were significant early warning signs of dropout (Gibbs & Heaton, 2014; Sabates, Hossain, & Lewin, 2013). If children were significantly older than their peers as they reached the end of the primary or secondary cycle, social and economic factors were more likely to prevent them from completing (Sabates et al., 2013). Additionally, children who repeated a grade two or more times (multiple repeaters) were more likely to drop out than children who repeated once (single repeaters). In South Africa, children who were more than two years older than the appropriate age for grade were 24.3% more likely to drop out of school (Kabay, 2016). These data suggest that age is related to repetition and dropout (Kabay, 2016).

Governments often choose automatic promotion policies because they assume this approach will prevent repetition, thus reducing dropout rates. They may be aware of data showing that repeaters are more likely to drop out (for example, Bernard, Simon, & Vianou, 2007; Glick & Sahn, 2010). In practice, when repetition is measured indirectly (that is, using demographic age–grade distribution data rather than reports from the education management information system [EMIS]), it is sometimes 30% to 35% higher than EMIS data. This tendency suggests that hidden repetition continues to affect dropout rates despite automatic promotion policies, rendering them an ineffective strategy for improving learning outcomes. Findings from an RTI International pilot study in Uganda on enrolment and repetition in primary 1 (P1) conducted in 2016 are a case in point. The pilot study showed that repetition reported by parents/guardians was in some cases 10 times higher than the official statistics (Brunette et al., 2017). This result is similar to the repetition patterns that RTI documented in Nicaragua in the 1990s (Gargiulo & Crouch, 1994).

If we compare the population of Ugandan children of the appropriate age to real enrolment in the corresponding grade, it exposes over-enrolment in primary 1, followed by a noticeable drop-off in primary 2. This trend cannot be explained by over- and under-age learners alone, because the GIR remained close to 140% for over 10 years. At some point, the population would run out of over- and under-age learners. A more plausible explanation for this bulge, as discussed above and supported by findings from the RTI pilot study in Uganda (Brunette et al., 2017), is hidden repetition. The relationship between hidden repetition and over-enrolment in lower primary school is not a new phenomenon, and has been documented in Africa by Bernard et al. (2007) and in Latin America in the 1980s by Schiefelbein and Wolff (1993).

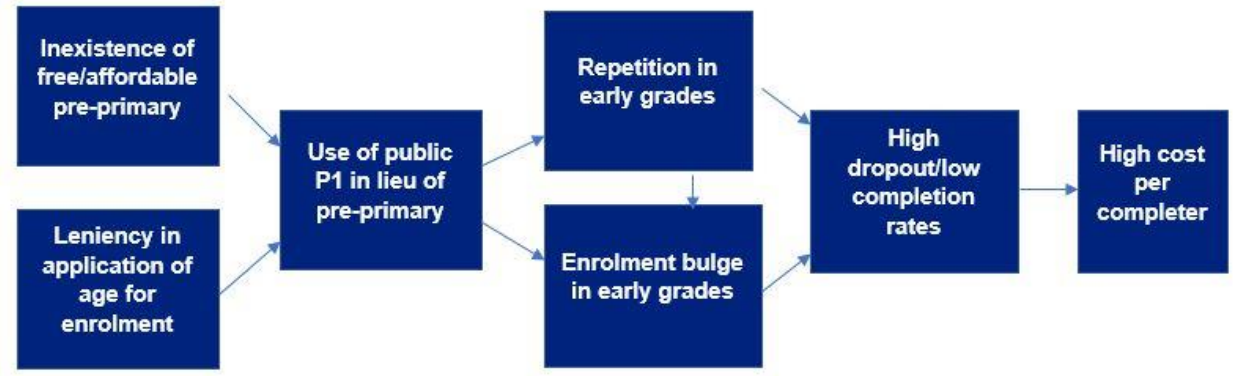
Repetition, along with dropout, is typically cited as a leading cause of waste of educational resources (Kabay, 2016). Repetition is also associated with an enormous financial burden to countries, with pupils in many African countries taking an average of five additional years to complete their pre-tertiary education than should otherwise be the case (N'tchougan-Sonou, 2001). Additionally, high levels of repetition threaten the system's ability to provide high-quality education because of the higher costs per pupil, and the increased overcrowding in classrooms (Crouch & Merseth, 2017). High repetition rates also disproportionately affect learners who are already at risk, including learners with disabilities. For example, Human Rights Watch (2015) found that many pupils with disabilities in South Africa had repeated the same grade for more than two or three years, without any attention given to their individual needs.

Combatting inequality in schooling early increases system efficiency and is economically productive (Heckman, 2008). Early childhood development (ECD) programmes, including pre-primary education, have been shown to help 'even the playing field' for learners entering primary school, especially for those from disadvantaged populations (Kirp, 2007; Nores and Burnett, 2010). One of the particular connections between ECD programmes and lower primary is that children who have attended pre-primary tend to repeat less—a tendency that, as this study will demonstrate, takes place in Uganda as well as in many other countries.

While there is scant research from low- and middle-income countries on the benefits of ECD policies as they relate to cost, data from Uganda have suggested a benefit-to-cost ratio ranging from 1.6 to 8.6 (Behrman & van Ravens, 2013). Other analyses of the benefit-to-cost ratio for ECD programmes have found returns ranging from 6:1 to 18:1 (Engle et al., 2011).

The existing body of evidence, while having large gaps in sub-Saharan Africa, has shown that providing ECD programmes can reduce repetition, the number of over- and under-age learners, and the number of overcrowded classrooms. These changes, in turn, improve learning outcomes and completion rates. Following this line of reasoning, increasing access to high-quality ECD programmes could improve the overall efficiency of a country's education system. The conceptual framework of the current study is outlined in ***Figure 1***.

Figure 1. Conceptual framework



1.2 Objectives of the Current Study

The current study replicated the RTI smaller scale pilot study described above, as a way to contribute further to the knowledge base on the magnitude of repetition in a national sample in Uganda. Specifically, the current study had two related objectives. The first was to learn about the efficiency of early primary and pre-primary education in Uganda by examining the relationships among enrolment, repetition, and pre-primary enrolment rates in a nationally representative school sample. The second objective was to assess the impact of the repetition estimates found in our study on policy and primary education sector spending at the national level. Sections 2 and 3 are framed by these two objectives.

This research will also serve as a valuable resource for policy dialogue with the Ugandan Ministry of Education and Sports (MoES) and other stakeholders around the quality, delivery, and efficiency of education; recommendations are summarized in Section 4. Findings from the school study on parents'/guardians' perceptions of pre-primary education should be useful to the Government of Uganda (GOU) as it plans to provide early childhood education – a service that is currently largely supplied by private providers.

2. Objective 1: National School Study

2.1 Research Questions

This section focuses on Objective 1 (referred to as the 'national school study'), and answers the following research questions.

Research Question 1: What is the enrolment pattern and the age distribution of pupils enrolled in primary 1, according to school records, teachers, and parents/guardians?

Research Question 2: What is the repetition rate in primary 1, according to school records, teachers, and parents/guardians?

Research Question 3: What is the relationship between repetition and age of enrolment in primary 1?

Research Question 4: What is the enrolment rate in pre-primary education and its relationship with primary 1 repetition?

Research Question 5: What are parents'/guardians' attitudes and expectations about pre-primary education and repetition in primary 1?

2.2 Methodology

This section summarizes the research methods used; ***Annex 1*** offers further details.

Sample Selection

To allow for estimates of pupil repetition at the national level while still permitting some regional disaggregation, and to control project cost, we sampled schools from within selected districts. We selected districts using a stratified simple random sample technique, with the 10 sub-regions acting as strata. The number of districts sampled per sub-region depended on the number of districts contained in each sub-region; sub-regions with more districts made up a larger part of the sample of districts. This technique helps to stabilize district-level weights across the sub-regions, allowing each sampled district to represent a similar number (about five) of districts from the population. The desired number of districts sampled from each region is detailed in ***Table 1.***

When the number of sampled districts did not evenly distribute over the sub-regions, sub-regions with higher district counts contributed more to the district sample. For example, the Northern region was composed of three sub-regions, with eight districts making up the sample. Each sub-region contributed two districts to the sample and the two largest sub-regions contributed one additional district to the sample.

Table 1. Number of districts sampled, by region

Region	Sub-regions	No. of sub-region clusters	No. of districts in region	No. of districts sampled in region
Northern	West Nile, North Central, North East	3	39	8
Eastern	Mid Eastern and East Central	2	24	5
Western	Mid Western and South Western	2	28	6
Central–Kampala	Central 1, Central 2, and Kampala City	3	24	5

We selected five schools within each sampled district using probability proportional to size sampling from a frame of all public and private schools with primary 1 pupil enrolment between 20 and 700 pupils. We applied these cut-offs to both public and private schools. Schools with less than 20 pupils were omitted from the sample frame, both to protect against selecting informal private schools and to lower the cost. This approach resulted in only about 1% of pupils being left out of the overall sample frame. Most of the schools (99%) in the sampled districts

had less than 400 enrolled primary 1 pupils. Using this as a measure, we omitted the largest schools from the sampling frame, also for cost reasons. Thus, two schools from the Northern region and three schools from the Western region were removed from the initial school sampling frame. Within each sampled school, 12 pupils were randomly selected.

Instruments

Five instruments used in the pilot study were revised, adapted, and translated into 13 languages for use in the national study.

Parent/guardian interview. Interviews with parents/guardians included questions about the pupil's primary and pre-primary school attendance and repetition, as well as the parent's/guardian's expectations and knowledge about school.

Teacher interview. Teachers were interviewed about each pupil in the sample. Questions covered primary and pre-primary school enrolment, repetition, and the teacher's expectation of the pupil's progression into primary 2.

Primary 1 and primary 2 school records review. Classroom registers, enrolment registers, and EMIS forms were reviewed for classroom- and school-level information about enrolment by age and gender. Number of repeaters, if noted in records, and pupils with unknown ages were also recorded.

Head teacher interview. Head teachers were interviewed for information about primary 1 classrooms, such as the number of streams and any instance of special streams for younger children.

Teacher expectations interview. Teachers were asked to determine the number of pupils in the classroom expected to repeat primary 1 and expected to progress to primary 2.

Protocol

Data collection occurred over two days at each school. The research team practised the approach for the school visits during the pilot phase, using the following protocol:

1. **Interview with the head teacher:** Upon arrival at the school, the data collection team oriented the head teacher to the purpose of the study and study activities. They then interviewed the head teacher.
2. **Pupil sampling:** A random sample of 12 pupils was selected from across primary 1 classrooms in each school.
3. **Preparation of parent/guardian communication:** Letters were prepared for the parents/guardians of selected pupils to invite the parent/guardian to participate in the interview. The letter was sent home with pupils at the end of the school day. Parents/guardians were given a date and time range to arrive at the school for the interview.
4. **Review of classroom-level records:** Data collectors reviewed the available classroom, head teacher, and EMIS records at the school. Classroom registers were typically attendance registers kept by the teacher in the classroom. Head teacher records were typically enrolment records kept by the head teacher when pupils enrolled in school.
5. **Classroom headcounts:** Data collectors took a headcount of the number of boys and girls who were in attendance on the day of data collection.

6. **Teacher interviews:** Teacher interviews about the randomly selected pupils were conducted after the conclusion of the school day.
7. **Parent/guardian interviews:** Parent/guardian interviews were conducted on the second day of data collection. The interviewee did not have to be a biological parent, but did need to be knowledgeable about the education of the pupil. A transport stipend of 7,000 UGX per selected child was given to one parent/guardian after the interview.

All data were recorded using Tangerine® software on Android tablets. Assessors synchronized data daily with RTI servers and statisticians checked the data for quality during the data collection. RTI statisticians then cleaned and analysed the data.

Overview of data collected

In all, 1,440 pupils were randomly selected from 120 schools across 24 districts in Uganda. The number of schools in rural areas was 101; in urban areas, 7; and in peri-urban areas, 12. Three private schools were visited and the rest were public schools (*n* = 117). Interviews with 1,439 teachers, 115 head teachers, and 1,318 parents/guardians were conducted. A response rate of 92% from parents/guardians was achieved. Data collectors performed a headcount from streams in 110 schools, and gathered information from school records in 118 schools.

Although the sample included 120 schools in total, not all schools were able to provide certain records. ***Table 2*** shows the classroom-level data source and number of schools from which data were collected. Two schools (one peri-urban, one rural) did not have any school records available for review.

Table 2. Schools with classroom-level data

Source	No. of schools represented	Percentage of schools*
Classroom register	93	77.5%
Head teacher records	74	61.7%
EMIS records	63	52.5%
No records at all	2	1.7%
Headcount	110	91.7%

*Each school was to collect data from each source, so this column does not total to 100%.

Sample description

The mean age of pupils in the sample was 7.6 years. ***Table 3*** below shows the demographics of the sample. The sample was equally made up of girls (50%) and boys (50%). According to parents/guardians, 9% of pupils had a disability, including hearing impairment (3%), physical impairment (2%), and visual impairment (1%). Most parents/guardians reported having attended some primary school (84%) and 22% attended at least some secondary (not shown).

Table 3. Sample demographics

Characteristic	Percentage of sample

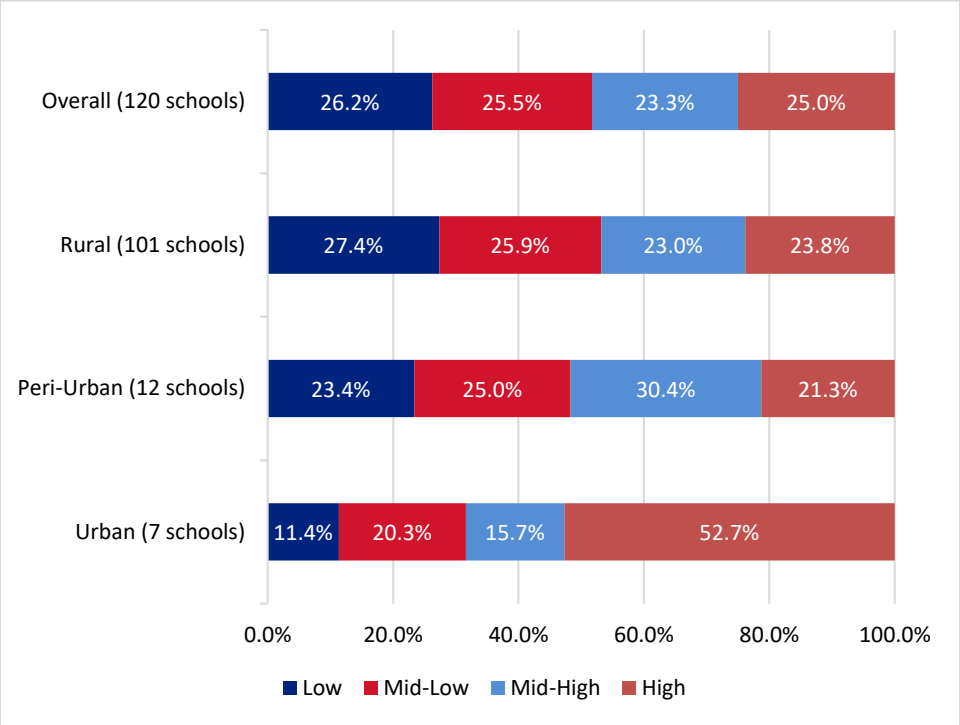
Girls	49.8%
Boys	50.2%
Under-age	11.2%
Target Age	45.0%
Over-age	43.8%
SES Low	26.2%
Mid-low	25.5%
Mid-high	23.3%
High	25.0%
With disability	9.1%
Parent/guardian highest education level completed No school	14.1%
Nursery	0.2%
Some primary	46.2%
Completed primary	15.3%
Some secondary	10.2%
Completed O levels	7.1%
Completed A levels	1.8%
Completed more than secondary	3.3%
Don't know	1.6%
No response	.4%

To gather information about families' financial situation, we created a wealth index using Principal Component Analysis. The interviewers asked about ownership of seven household items, plus services such as electricity in the home. The responses served as a proxy for socio-economic status (SES). ***Annex 2*** shows the list of questions asked of parents/guardians and the factor coefficients used for the calculation of wealth indices.

In order to create simple categories by which to compare other outcomes, and in accordance with well-established methodology, this index was then divided into quartiles to represent Low, Mid-Low, Mid-High, and High SES groups within the sample. The socio-economic status values of the pupils in the sample were evenly distributed across low (26%), mid-low (26%), mid-high (23%), and high (25%) wealth indices.

These SES quartiles are a relative measure within our Ugandan target population as a means to differentiate the population by wealth. The quartiles do not have particular sociological implications; they are simply a sorting of parents'/guardians' SES. ***Figure 2*** below shows the estimates of SES of the families in our sample broken down by urban, per-urban, and rural location.

Figure 2. SES quartiles of sample, by school location



Existence of pre-primary in government schools

Although government schools do not officially provide pre-primary education, the research team did find pre-primary classrooms within primary schools when they visited to practise data collection before the full survey. Subsequent discussions with officials in the MoES and additional information acquired from the head teachers and teachers of those schools led to the following decision about the handling of the pre-primary classrooms in public schools: Any pre-primary classrooms found in our sample of government schools were counted as primary 1 classrooms in the study if they were reported in EMIS forms as primary 1. The head teacher interview was designed to identify whether a pre-primary classroom existed at a school, as well as whether it should be categorized as a primary 1 classroom for the purposes of the study. If the head teacher stated that pupils in a pre-primary classroom were reported in EMIS forms as primary 1 pupils, the assessors were to include these 'pre-primary pupils' in the sampling for the study as well as include school records related to those classrooms in their review. This was the only option that made it possible to compare the school data to official data. Henceforth, these

pre-primary pupils and classrooms will be referred to in this report as ‘hidden pre-primary’. We have used this terminology because these pre-primary classes were unacknowledged as truly pre-primary in official records.

The nature of the questions and classifications we created were themselves strong evidence of the informality with which these matters operate in Uganda. They also highlighted the issues and policy implications previously addressed by Cambridge Education (2017).

According to head teachers, 34 schools (35%) included a pre-primary classroom of some sort. Eleven of these schools submitted the pre-primary pupils under enrolment as primary 1 pupils in EMIS records. Therefore, as indicated above, the assessors included these hidden pre-primary pupils from the 11 schools (9% of the sample) in the sampling process for the current study. This constituted only 3% of the sample, so the quantitative impact would not have been large. However, in our view it was the correct way to proceed, since the idea was to compare informal repetition to repetition formally reported for grade 1.

Our sample included 34 pupils (3%),18 girls and 16 boys, who were in a hidden pre-primary classroom. Out of this sub-sample of hidden pre-primary pupils, over half (61%) were under-age for primary 1 grade, with 18% in the target-age group and 21% in the over-age group. The mean age of pupils in the hidden pre-primary sample was 5.8 years. The sample characteristics described in the prior section included the pupils in hidden pre-primary. An additional 36 pupils were found to be current primary 1 pupils who had previously been enrolled in hidden pre-primary but who had progressed to primary 1.

Because the pupils were officially reported as enrolled in primary 1, they were included in most of our subsequent analyses as primary 1 pupils. However, neither the current hidden pre-primary pupils nor the past hidden pre-primary pupils were included in the report on pre-primary exposure (due to having been already counted as primary 1 pupils in EMIS records). Nor were they counted in some reports of parent/guardian responses in the section referring to Research Question 5. In these instances, it will be noted where hidden pre-primary pupils are excluded.

Multiple primary 1 streams per school

We found anecdotal evidence suggesting that some head teachers of primary schools may utilize multiple primary 1 streams to ensure that learners complete primary 1. In other words, younger pupils are steered toward one particular stream and then progress to a different stream the following year. Thus, the head teacher interview also inquired about primary 1 streams. ***Table 4*** below shows responses from head teachers.

Approximately 38% (*n* = 45) of head teachers reported that their school included more than one primary 1 stream. Of these, a little more than half reported having two primary 1 teachers and 27% reported having four or more primary 1 teachers in their school. Head teachers reporting multiple primary 1 streams were also asked if one of the streams was dedicated to ‘younger pupils’ who enrolled in the school.[1] Of those 45 head teachers, 23 (51%; or 29% of total sample) responded that one of the primary 1 streams was for the younger pupils who enrolled.

These findings gave empirical support to the anecdotal evidence of head teachers using multiple primary 1 streams for younger pupils. Moreover, as we indicate in a later section, primary 1 teachers also reported that some pupils would progress the following year to another

[1] Data collectors were trained to explain that ‘younger pupil’ meant under-age for primary 1 grade.

primary 1 stream. Hence, some head teachers with enough resources may have figured out a way to manage pupils enrolling at a young age by systematically grouping them in a particular primary 1 stream, rather than randomly placing them across streams. It seems that this may have been the head teachers' way of trying to appropriately handle the situation from a developmental point of view, but without official guidance or support. Again, this arrangement emphasizes the operational informalities that head teachers use regarding age, as well as highlighting the need for greater policy standardization and guidance.

Table 4. Primary 1 streams per head teacher report

Number of primary 1 streams	Percentage	*n*
1	58.3%	70
2	25.8%	31
3	7.5%	9
4 or more	4.2%	5
Missing	4.2%	5
Number of primary 1 teachers	**Percentage**	***n***
1	4.4%	2
2	51.1%	23
3	17.8%	8
4 or more	26.7%	12
Primary 1 stream for younger pupils	**Percentage**	***n***
Yes	51.1%	23
No	48.9%	22

2.3 Findings

The findings of this study are presented in response to the research questions outlined in Section 2.1. We have drawn on all the data sources available to present a complete depiction. Statistics included in this section reflect population-weighted estimates.

Research Question 1: Pupil enrolment by age

This section reports on the ages of pupils enrolled in primary 1. We exposed the distribution of pupils who were under-age, at target age, and over-age for grade by collecting age data from interviews and school records. Uganda's official government policy (the Education Act of 2008) states that 'primary education shall be universal and compulsory for all pupils aged 6 (six) years and above which shall last seven years'. Thus, age 6 was considered target age. However, as

some children may have entered primary 1 at age 6 and turned age 7 during the school year, the target age was adjusted to include pupils aged 6 or 7 years.

Then, we categorized the age data collected into the following groups:

1. Under-age for grade: 5 years and younger
2. Target age for grade: 6 and 7 years
3. Over-age for grade: 8 years and older

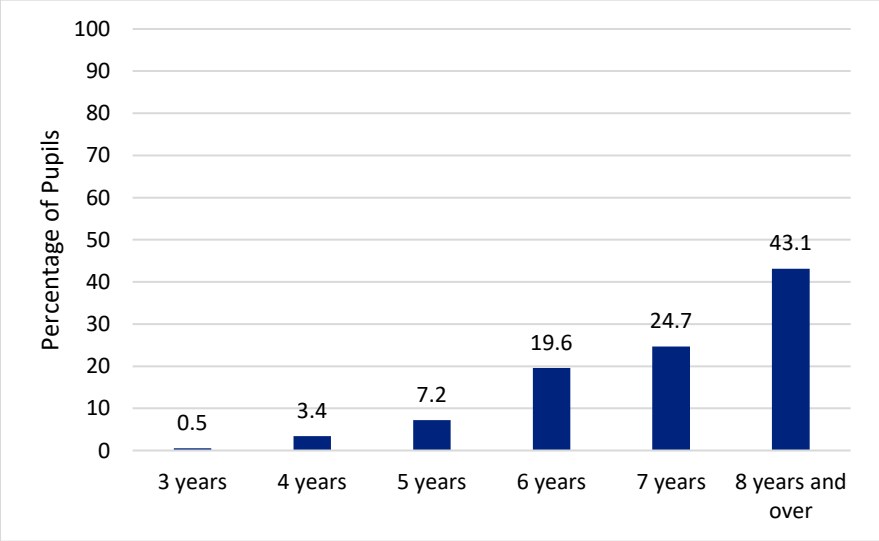
Since our data were collected at the end of the school year, it is likely that many pupils turned 7 years old during the school year, which would account for the larger percentage of children who were 7 years (25%) rather than 6 years (20%), as found from the parent/guardian report. Considering both 6 and 7 as target age avoided the mistake of misclassifying some children as over-age. However, note that this liberal interpretation could underestimate the over-age population.

Enrolment and age distribution in primary 1

Enrolment data were collected through classroom registers, head teacher registers, and EMIS forms at the schools. School records may have included either age or date of birth (DOB). If DOB was recorded, the age was calculated from the year of birth. Age category for all school records was calculated by total number of pupils in each age category in primary 1 divided by the total number of pupils overall in primary 1 (with the exception of unknown ages).

The age distribution from parent/guardian data is shown in ***Figure 3.*** The sample from the parent/guardian reports differed from the sample from the school records, because the parent/guardian reports represented a subset of the total represented in the school records. Nevertheless, these data should be representative of the respective schools and therefore the country.

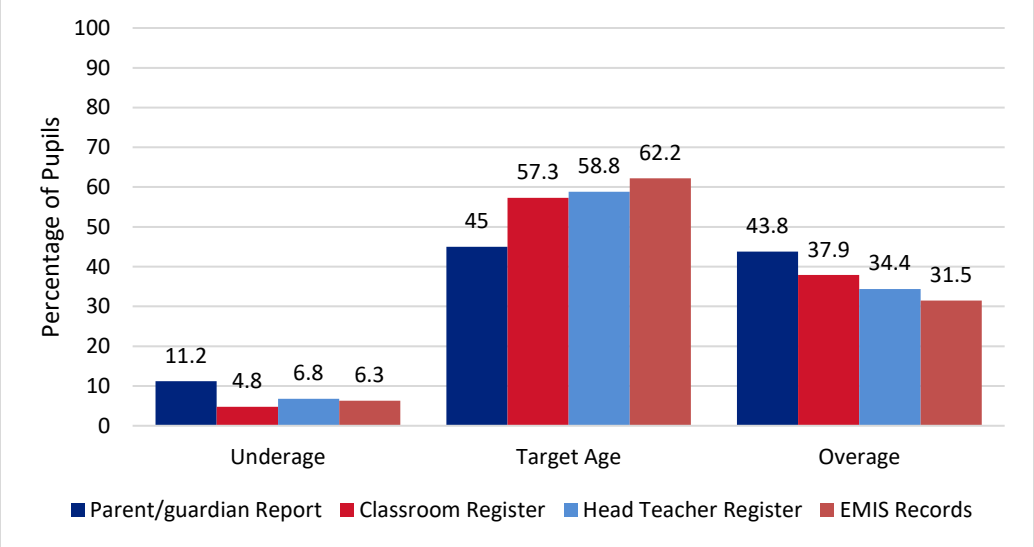
Figure 3. Pupils' age in primary 1



Source: Parent/guardian interviews.
n = 1,318; unknown age = 1.6%; includes hidden pre-primary pupils.

Figure 4 shows the percentage of pupils in each age group, by source. Most pupils, regardless of source, were approximately the appropriate age for primary 1. However, parent/guardian reports of pupil age did show an approximately equal number of pupils who were at target age and over-age. These data differed from school records, which showed higher percentages of pupils in the target-age group than in the over-age group. Another finding from the reports of age was that across sources, low levels of children were under-age for grade, despite anecdotal reports to the contrary.

Figure 4. Percentage of pupils in each age group by source (total across schools)



Parent/guardian report *n* = 1,318; classroom register *n* = 11,575; head teacher records *n* = 9,660; EMIS records *n* = 10,330. Calculations of age group by class records involved calculating percentages across the total number of children at each age group across schools.

Interestingly, parent/guardian reports of the age at which they enrolled pupils in primary 1, displayed in ***Table 5***, showed a much higher percentage of under-age pupils than what was found above (29% versus 11%). This suggests a discrepancy in parent/guardian reports when they were asked about age of enrolment in slightly different ways. Parents/guardians could report with better accuracy the child's current age rather than recalling past age of enrolment. However, it is also possible that parents/guardians were more honest in their reporting of pupil age when discussing decisions made in the past (i.e. reporting the age at which they enrolled their child) versus in the present (i.e. reporting the current age of the child), especially if the current information defied the policy of age in primary 1.

Table 5. Age at which parents/guardians enrolled pupils in primary 1

Age	Percentage	*n*
Under-age / Age 5 or below	29.4%	359
Age 3 or less	3.5%	39

Table 5. Age at which parents/guardians enrolled pupils in primary 1		
Age	**Percentage**	***n***
Age 4	8.8%	111
Age 5	17.1%	209
Target age	48.0%	682
Age 6	27.2%	385
Age 7	20.8%	297
Over-age / Age 8 or above	20.9%	262
Don't know	1.7%	15

Headcount in primary 1

In addition, the data collectors took headcounts of each primary 1 classroom, to understand the mean number of pupils present in a primary 1 class on the day of the visit (a relatively random event). They could then compare those values to the mean number of pupils formally enrolled in the class. The mean number of pupils present (all streams collapsed) by school (for the schools reporting this count) was 105 (*n* of schools = 110). In contrast, teacher records showed that 91 children on average enrolled in primary 1 across streams at the school level (*n* of schools = 93). These data showed that more pupils were attending school than were reported enrolled in the teacher records, suggesting that enrolment records were not accurate. It is also possible that school records were accurate, but that more pupils showed up at school than were enrolled.

Discussion of findings, Research Question 1: Enrolment and age distribution

The investigation of data from school records and parent/guardian interviews of a nationally representative sample showed that across sources, pupils both above and below the appropriate age were attending primary 1. In fact, all data showed the sample pattern of results, with the most pupils in the target-age range, then the over-age range, and then the least number of pupils in the under-age range. This held true for school records despite the policy on the age of enrolment in primary 1. Parent/guardian reports showed higher percentages of pupils who were under-age and over-age for grade than any of the school record sources. The bulk of over-age pupils suggested hidden repetition or late enrolment in primary 1, which is investigated in the following sections.

Research Question 2: Repetition rates in primary 1

This section compares and contrasts the repetition rates found from the different sources in order to understand the various perceptions of repetition in primary 1. We collected repetition data at the classroom level from school records and from a nationally representative sample of pupils, at the pupil level, through parent/guardian and teacher interviews. If repetition data were not included in school records, we omitted those sets of records during the comparisons. Parents/guardians and teachers were asked to identify the class or level the pupil attended in the last school year. Parents/guardians and teachers were also asked if the pupil was a repeater.

Parents/guardians reported that 52% of pupils (*n* = 616) repeated primary 1, whereas teachers reported that 41% (*n* = 572) were repeaters. As shown in ***Figure 5***, the incidence of repeaters

was much lower in school records than what was reported by parents/guardians and teachers, with as high as a 40 percentage point difference (between parent/guardian report and head teacher register). ***Table 6*** shows that for both parents/guardians and teachers, the most commonly reported reason for repetition was that the child did not learn enough.

Figure 5. Percentage of pupils identified as repeaters, by source

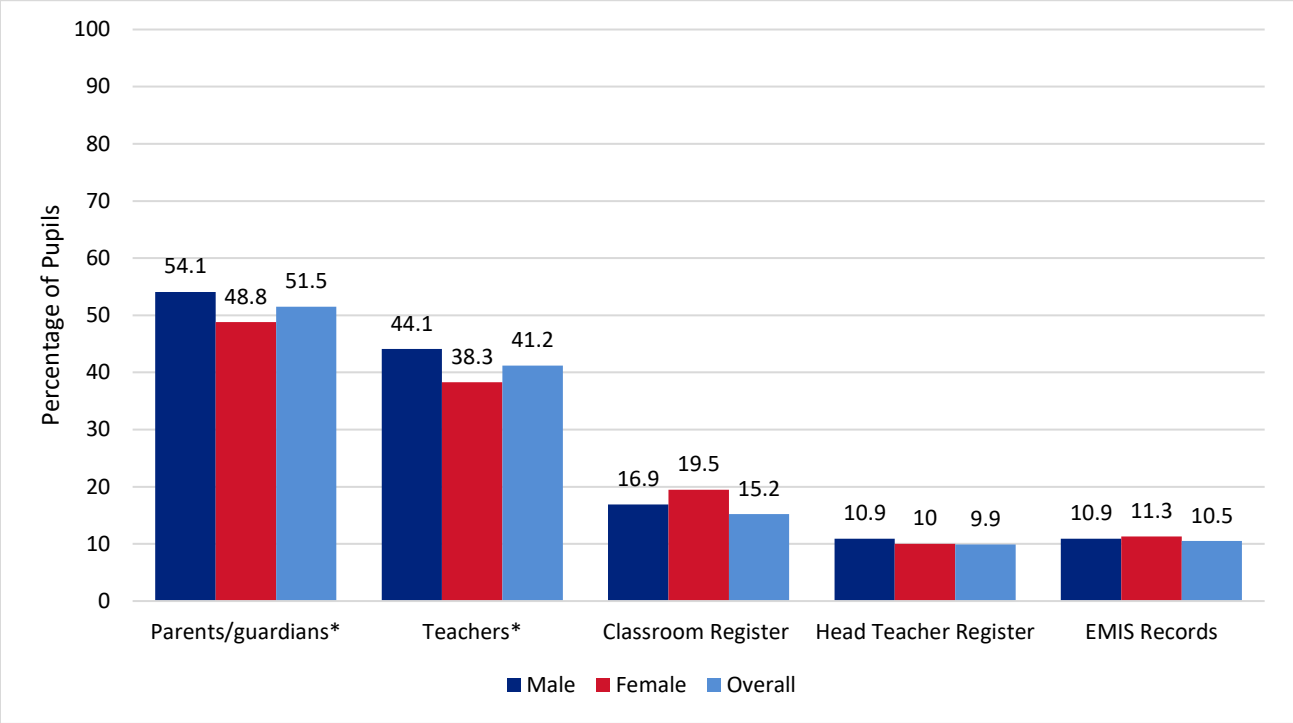


Table 6. Reasons for repetition, by parent/guardian and teacher report*

Parent/guardian report	Percentage[a]	*n*
Child did not learn enough	18.8%	218
Child failed class	11.1%	133
Child is too young	4.4%	57
Child missed exams due to illness	3.0%	36
Child missed too much school	2.5%	32
Teacher report	**Percentage[a]**	***n***
Teacher or school didn't think child learned enough	22.8%	284
Child was sick or absent too often	6.9%	118
Child started too young	6.2%	92
Parent/guardian did not think child learned enough	4.4%	61

*Does not include pupils in hidden pre-primary.
[a]The reasons listed do not constitute all reasons given by parents/guardians and teachers; therefore, the percentages do not sum to 100%.

Parents/guardians and teachers[2] were asked about their expectations of pupils' class enrolment for the following school year. Whereas 77% of parents/guardians expected their child to progress to primary 2, fewer teachers (58%) expected the child to progress to primary 2. Teachers reported that 40% of pupils sampled would be expected to repeat primary 1.

This finding is surprising given the policy of automatic promotion, in that teachers should be passing pupils on to the next class level regardless of achievement level. It also suggests that teachers thought 40% of pupils were not learning enough, because the primary reason given to justify repetition was lack of learning. Teachers may have chosen to ignore the automatic promotion policy based on their assessment of the child's lack of learning and progress in primary 1. These results are presented in ***Table 7*** and ***Table 8.***

Table 7. Parent/guardian reports of expectation of next year

Reason	Percentage*	*n*
Primary 1 (child is expected to repeat primary 1)	19.4%	216
Primary 2 (child will progress to next grade)	77.1%	1059

*Includes pupils in hidden pre-primary.

Table 8. Teacher reports of expectation of next year

Reason	Percentage*	*n*
Primary 1 (pupil is expected to repeat primary 1)	40.9%	568
Another primary 1 stream/classroom	14.7%	181
Same primary 1 stream/classroom	26.2%	387
Primary 2 (pupil will progress to primary 2)	57.1%	844

*Includes pupils in hidden pre-primary.

Discussion of findings, Research Question 2: Repetition rates

Our data showed that despite the policy of automatic promotion, Uganda was experiencing not only a bulge of over-age pupils in primary 1, but also a high rate of repetition. Although school records aligned with national EMIS data on repetition rates, parents/guardians and teachers reported much higher rates, with a difference of as much as 40 percentage points. Parent/guardian interviews showed the highest repetition rates of any source, although only somewhat higher than teacher interviews. These data imply that repetition is much more prevalent in Uganda than the official statistics suggest.

As discussed previously, repetition is costly for governments, thus affecting the efficiency of education in several ways. Repetition both is caused by and contributes to low learning

[2] Teachers were asked to estimate an answer based on their knowledge of the achievement trajectory of the child. No formal assessment was involved.

outcomes. It is associated with an increased likelihood of dropout and high rates of school incompletion. Additionally, repetition is a primary factor in the overcrowding of classrooms, impacting the quality of education that all pupils are receiving. Thus, even pupils who are not repeaters are adversely affected by high repetition rates.

The data also suggested that parents/guardians and teachers, as well as possibly head teachers, were not adhering to the policy of automatic promotion, instead deciding to progress pupils based on their learning achievement. Parents/guardians and teachers seem to have agreed that if a pupil did not learn enough, he or she should not progress to the next grade. Since automatic promotion is not being implemented, the Ministry may need to provide guidance to schools about retention in the early grades to ensure that pupils' learning is being assessed properly.

Lack of concordance of reported repetition rates by source is also concerning. Policy decisions may be based upon enrolment and repetition data reported to the government. Important policy decisions, such as the setting of priorities and the allocation of resources, would then be affected by incomplete or inaccurate data. This may result in inefficient spending in education with an already constrained budget. A misalignment of perceptions around such key facts as repetition certainly cannot be contributing to optimal policy making, regardless of whether the truth about repetition is closer to parent/guardian reports at 50%, closer to school records at 10%, or somewhere in between.

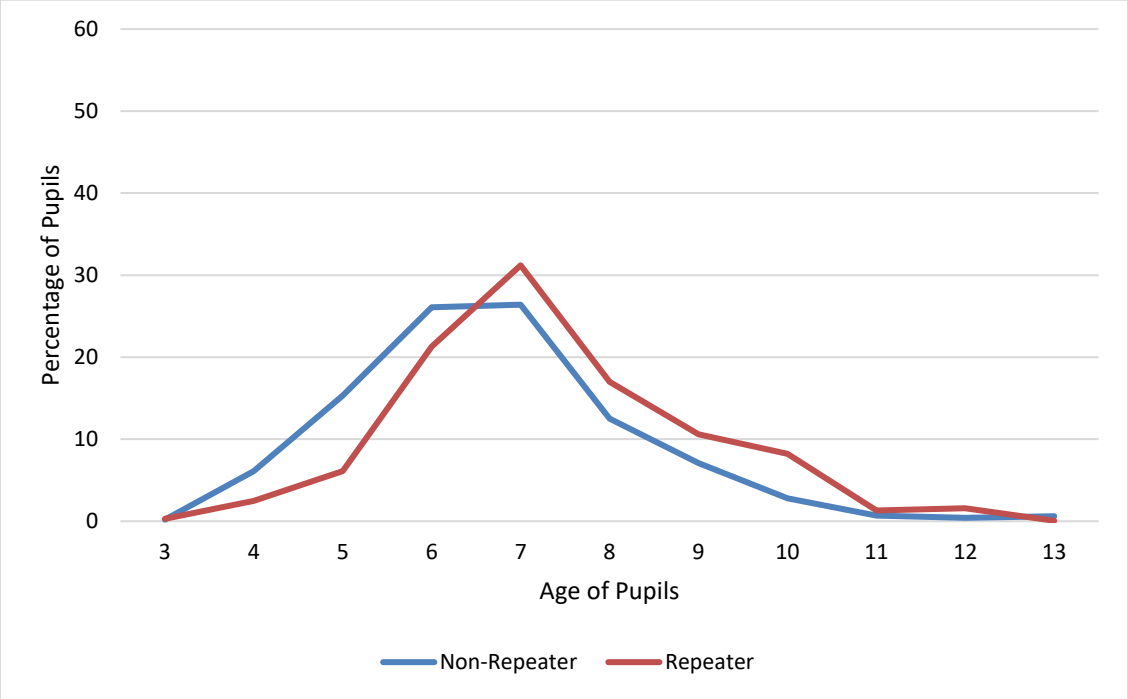
These findings imply a need for a review of policy around the early grades, including the preparation of pupils for entering primary 1 school-ready.

Research Question 3: Relationship between repetition and age of enrolment

This section presents the differences between repeaters and non-repeaters when examined in relation to parent/guardian-reported age of pupils and the official age of enrolment. In approaching this research question, first we calculated the mean age of repeaters and non-repeaters. To do so, we calculated age from parent/guardian-reported DOB to get a better distribution of age, and from parent/guardian-reported repetition.

Figure 6 below shows the age distribution of non-repeaters and repeaters. We found that on average, the non-repeaters were younger (6.6 years) than the repeaters (7.3 years) by 0.7 years, a statistically significant difference (p <.00). Although it may seem that repeaters should be exactly one year older than non-repeaters, this would not be true if repeaters were being enrolled somewhat earlier than non-repeaters. This theme is explored below.

Figure 6. Age in years, by repeater status, parent/guardian-reported



Not surprisingly, more repeaters were overage than were target-age or under-age pupils, according to both parent/guardian reports and teacher reports of the sample, shown in ***Figure 7***

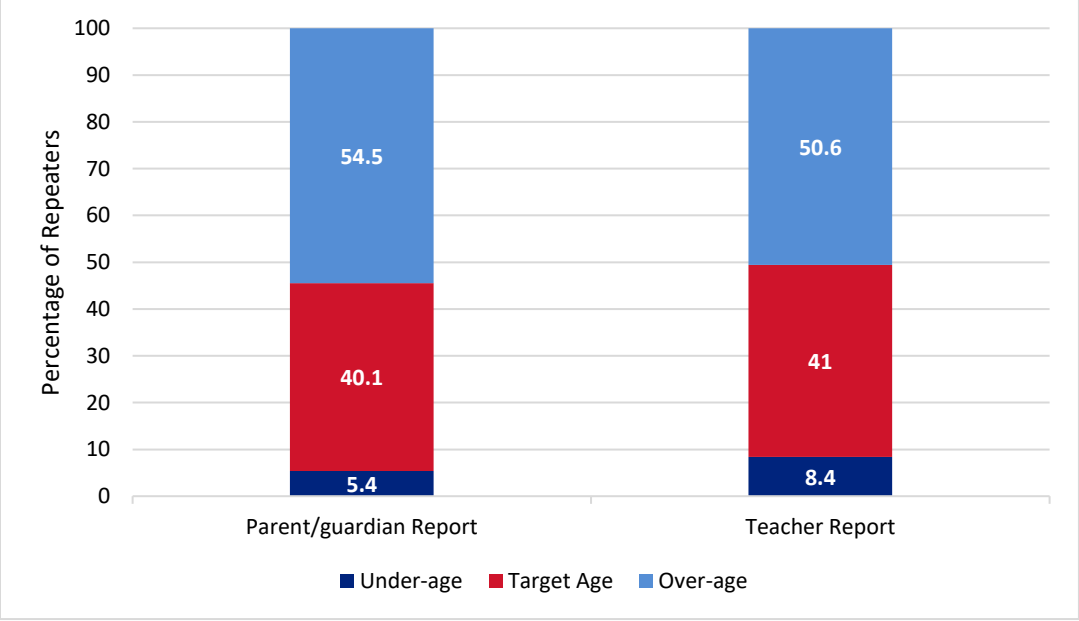
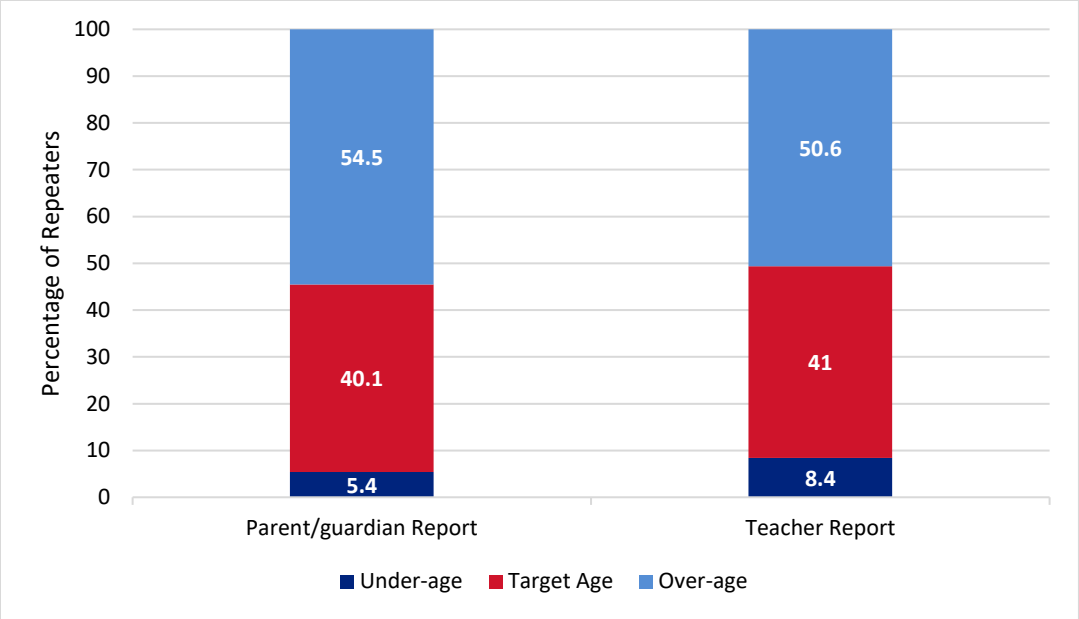


Figure 7. Age categories of repeaters, by parent/guardian and teacher report*



*n is out of total repeaters, including hidden pre-primary pupils.

Parents/guardians who enrolled their children in school early (before age 6 years; n = 347) were then asked the reason for sending their child to primary 1 early. Their aggregated responses are shown in ***Table 9.*** The most cited response from the parents/guardians regarding why they sent the child to primary 1 early was to learn (40%). The second and third most cited reasons for early enrolment in primary 1 were that the child wanted to go (14%) and the child was ready (16%).

It is sometimes hypothesized that parents/guardians may send children to school early because the parents/guardians need to work, and thus school is serving as a substitute for child care. However only 11% of these parents/guardians listed their need to work as the rationale for sending a child to school early.

Table 9. Reasons parents/guardians sent child to primary 1 early*

Parent/guardian response	Percentage	*n*
To learn	39.7%	139
Child wanted to go	13.6%	62
Child was ready	16.4%	61
I need to work	10.7%	31
Suggestion from others	4.5%	15
There was no pre-primary nearby	3.4%	10
It is expected	2.8%	8
Could not afford pre-primary fees	2.4%	5

*Sample constitutes children who were enrolled in primary 1 before age 6. Does not include hidden pre-primary students. n = 347.

Additionally, parents/guardians were asked if they expected the child to repeat *because* he or she was enrolled early. Over half (56%) of parents/guardians responded that they knew the child would likely repeat primary 1 as a result of going to school before they turned 6 years old. This finding, taken in conjunction with the reasons for early enrolment discussed above, suggests unmet demand for pre-primary education. Parents/guardians may have believed that children younger than 6 years old were ready to learn and thus sent them to school even though there was no age-appropriate option available – with the understanding that they might spend more than one year in that classroom. Additionally, 61% of parents/guardians also responded that they expected their child might learn less in the first year by beginning school early. If so, the parents/guardians would have been acknowledging that the instructional quality or content of curriculum in primary 1 might be insufficient or inappropriate for their child.

Discussion of findings, Research Question 3: Relationship between repetition and age of enrolment

Our data on repetition built on the findings from the previous two research questions by extending the understanding of repetition and age of pupils in primary 1. Not surprisingly, parent/guardian and teacher reports both showed that most repeaters were over-age for grade.

As noted above, we found that the non-repeaters were younger (6.6 years) than the repeaters (7.3 years) by 0.7 years. Repeaters in primary 1 were older than non-repeaters but were not a full year older, as one would expect. This is an important finding, for two reasons. First, given that 50% of pupils did repeat, according to parents/guardians, substantial 'active' aging was occurring in primary 1, as opposed to pupils simply being over-age at school entry. Second, it appears that repeaters were entering earlier than non-repeaters because, in primary 1, they were only 0.7 years older than non-repeaters.

Another finding is that, of the total number of pupils in primary 1 who were under-age, 25% were repeaters. Moreover, over half (56%) of parents/guardians who enrolled their child before the official age of enrolment reported that they knew the child would likely repeat primary 1 as a result of going to school early. Additionally, 61% of parents/guardians also responded that they expected their child might learn less in the first year by beginning school early. These findings indicate not only that being over-age is a problem, but also that under-age pupils are not shielded from repetition.

Research Question 4: Pre-primary enrolment and correlation with repetition in primary 1

Through parent/guardian interviews and interviews with teachers, we explored pupils' exposure to pre-primary education and its impact on later repetition in primary 1.

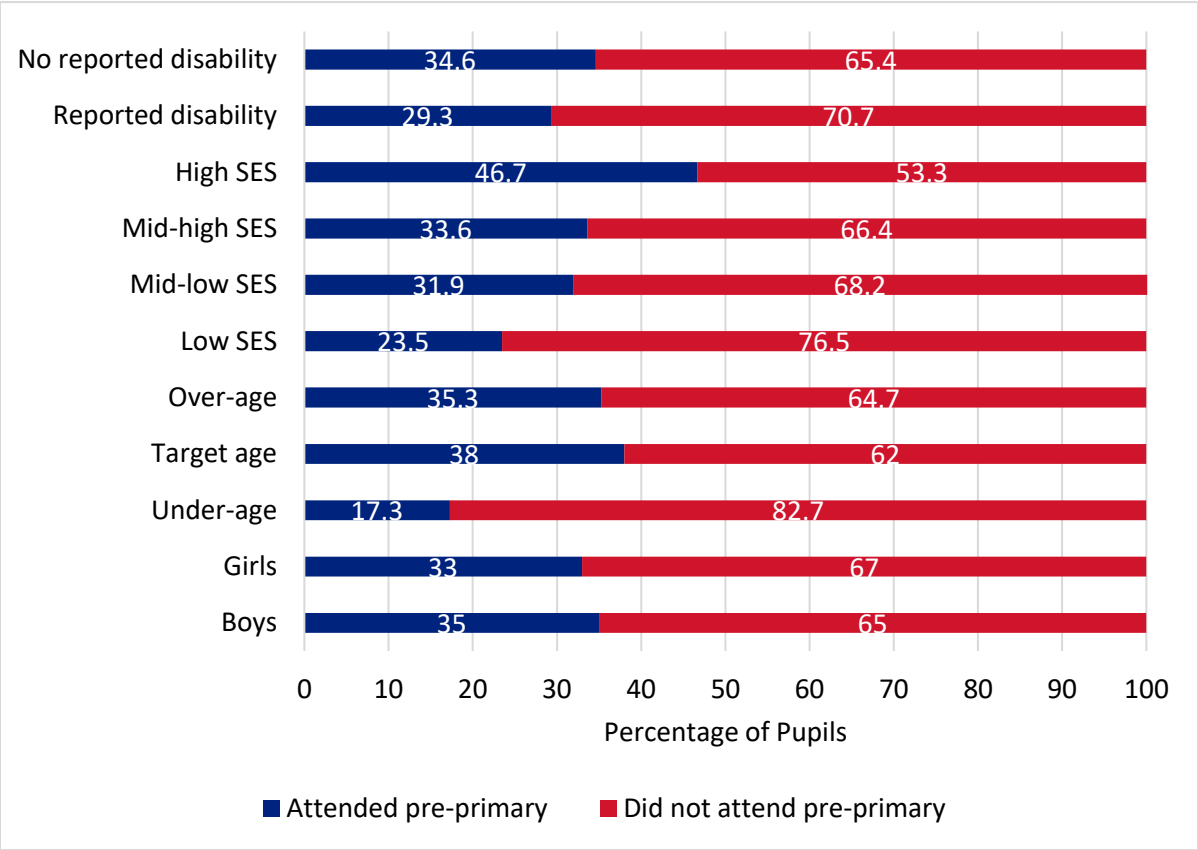
Pre-primary enrolment

Parent/guardian reports of pre-primary enrolment showed that 34% of pupils sampled attended some form of pre-primary school prior to primary 1. As shown in ***Table 10,*** of those who attended, 39% attended a registered school, whereas 33% did not, which might explain the discrepancy between this finding and official data. Considering only pupils who attended registered pre-primary classes, the estimate was approximately 13%. As noted in the recent Cambridge Education report (2017), pre-primary centres encounter difficulties in registering their centre for a variety of reasons, leading to some centres going unregistered.

Table 10. Pre-primary exposure		
Attendance status	**Percentage**	***n***
Attended pre-primary	33.9%	464
Registered	38.6%	168
Unregistered	33.2%	157
Don't know	27.4%	136
Did not attend pre-primary	59.4%	781
Attended hidden pre-primary	6.4%	70
Don't know	0.2%	3

Figure 8 shows other pupil characteristics by pre-primary exposure, including gender, age group, and SES. No significant differences were found in pre-primary attendance by gender or age group. However, pre-primary attenders did significantly differ by SES quartile, in which pupils from lower SES households had lower pre-primary exposure. ***Table 11*** shows that the percentage of pupils who attended pre-primary school for 1, 2, and 3 years was very similar.

Figure 8. Pre-primary exposure, by pupil characteristics



SES: socio-economic status.

Table 11. Number of years of pre-primary school attended*

Years	Percentage	*n*
Less than 1 year	11.7%	56
1 year	26.3%	133
2 years	32.0%	132
3 years	28.4%	133
Don't know	1.6%	10

**n* is out of pre-primary school attenders and does not include hidden pre-primary attenders.

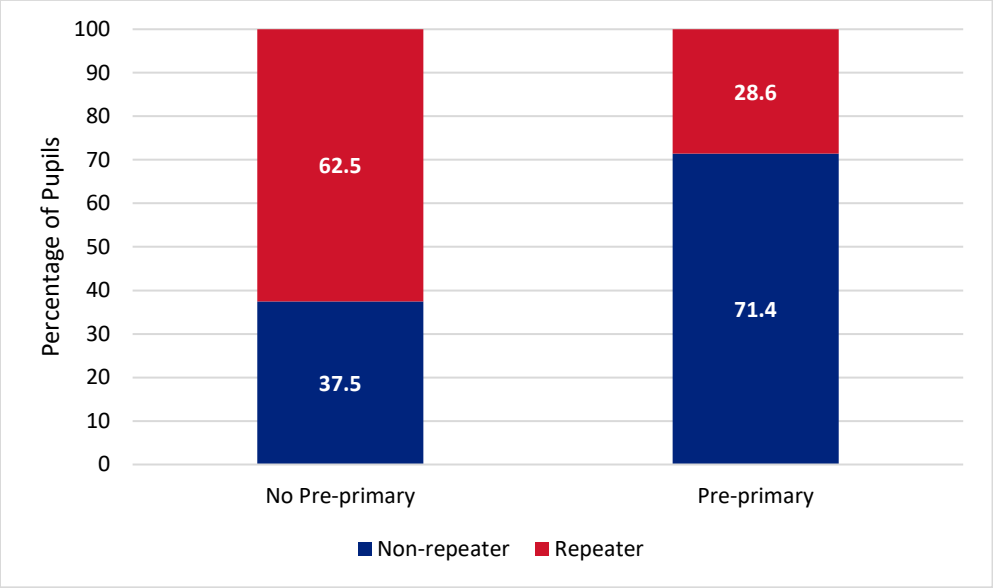
Pre-primary enrolment and repetition in primary 1

Parents'/guardians' reports of pre-primary enrolment and pupil repetition in primary 1 showed that pupils who did not attend pre-primary had significantly higher mean repetition rates than pupils who did attend pre-primary, without controlling for other variables ($p < .01$; see ***Figure 9***). A similar pattern emerged when we analysed teacher reports of repetition and pre-primary: Pre-

primary attenders had a significantly lower mean repetition rate than did pupils who did not attend pre-primary, without controlling for other variables.

To summarize, having attended pre-primary was associated with lower repetition rates by more than 50% on average – from 62% to 29%. This is an extremely large protective effect, likely occurring because attending pre-primary reduces the risk of low learning outcomes in primary 1.

Figure 9. Percentage of pupils who were repeaters and non-repeaters, by pre-primary exposure



Determinants of repetition and pre-primary exposure

Next, we wanted to know whether and how strongly pre-primary exposure, gender, age of enrolment, SES, and reported disability were associated with repetition. We calculated the relationships through an odds-ratio regression model, in which factors were added as control variables, instead of using the simple bivariate relationships shown above in the prior analysis. Additionally, we analysed the variables for association with pre-primary exposure.

Table 12 shows that, controlling for the other variables, pupils who did not attend pre-primary, pupils with disabilities, and pupils who were under-age (compared to target-age) at enrolment were significantly more likely to repeat. Pupils who did not attend pre-primary were 3.8 times as likely to repeat as pupils who did attend pre-primary. In other words, pupils who did attend pre-primary were 74% less likely to repeat than those who did not attend. SES and gender were not significant factors in the model for repetition.

Additionally, controlling for all other variables, pupils who were under-age compared to target-age at enrolment and pupils from mid-low- to mid-high SES households, compared to high-SES households, were less likely to have attended pre-primary school. In summary, being under-age and relatively poor meant that children had a higher likelihood of not attending pre-primary. In turn, not attending pre-primary put children at higher likelihood of repeating.

Table 12. Odds ratio for factors of repetition and pre-primary attendance

Determining factor	Odds ratio for repetition	Odds ratio for pre-primary
No exposure to pre-primary	3.8***	N/A
Being a girl	0.74	0.89
Under-age at enrolment compared to target age	1.65**	0.53**
Over-age at enrolment compared to target age	0.79	0.93
Lowest quartile SES compared to highest quartile SES	1.2	0.36**
Mid-Low SES	1.01	0.58**
Mid-High SES	0.75	0.62**
Disability (parent/guardian reported)	2.11**	0.79

SES: socio-economic status.
*$p < .05$; **$p < .01$; ***$p < .001$.
All parent/guardian-reported variables.

Vulnerable populations

To summarize the prior analysis, pupils reported as having a disability were more than twice as likely to repeat primary 1 as were pupils who were not reported as having a disability. However, pupils reported as having a disability were not statistically significantly less likely to have attended pre-primary school.

It should be noted that our study was not designed as a study of disability, and the number of pupils reported as having disabilities was only 58 – i.e. students with disabilities were not oversampled. Since the distribution of pupils reported as having a disability vs. not a disability was not close to equal, it is possible that our sample was not large enough to detect the difference. Therefore, this lack of findings should be viewed with caution.

In low-resource educational settings such as Uganda, pupils with disabilities are likely not to be receiving the differentiated instruction or materials that are required for them to progress and learn at the rate of their peers. That is, the lack of a finding of a statistically significant difference in pre-primary exposure might indicate that the pre-primary classroom instruction was of low quality and not sufficiently benefiting pupils with disabilities.

The odds-ratio model also showed that pupils from lower SES households were less likely to attend pre-primary school. Given that Ugandan pre-primary education centres are operated mostly by the private sector, and parents/guardians reported that finances were the main reason for not sending their children to pre-primary, it is logical that pupils from these disadvantaged backgrounds would not be able to attend pre-primary. Further, a recent study by Cambridge Education (2017) found that the poorer the area, the less likely it is to have private provision, community provision, or informal home provision of early childhood care and education. It is

interesting that, when we controlled for having attended pre-primary, being of high SES did not offer additional protection for repetition.

No significant differences were found between girls and boys in repetition rates or pre-primary exposure. Boys and girls were equally likely to have repeated primary 1 and equally likely to have attended pre-primary, a positive finding for the Ugandan primary education sector.

Discussion of findings, Research Question 4: Relationship between pre-primary enrolment and repetition in primary 1

The pre-primary exposure rate in our nationally representative sample (34%) was higher than the gross enrolment rate reported by UIS at 13% in 2016. A Cambridge Education study also found a higher rate of early childhood care and education participation rates at 22% in 2017. These two studies suggest that the participation rate in pre-primary education is indeed higher than officially reported. However, pre-primary access is nevertheless a significant problem.

Our findings suggest that pre-primary education offers pupils a protective effect from repetition: Pupils who attended pre-primary were less likely to repeat primary 1, even after controlling for SES, gender, reported disability, and age of enrolment to primary 1. This important finding aligns with other studies, which have shown that pre-primary education prepares pupils to enter primary 1 with the school readiness skills, including socio-emotional skills, needed to succeed. While our study did not explicit investigate the quality of current pre-primary provision, we believe investments in quality are likely to further strengthen the protective effect from repetition. A cost projection model of these investments and returns to efficiency and outcomes will be presented in the next section.

Lack of access to free or affordable pre-primary education was associated with inflated repetition, as discussed in a later section. Additional longitudinal studies are needed to explore the relationship between pre-primary education exposure and decreased dropout rates.

Additionally, our findings showed that pupils enrolled in primary 1 before they were developmentally ready for the instruction and content of primary school had a higher likelihood of repetition. Pupils entering school before age 6 years were 1.65 times more likely to repeat the class. This is especially important given that 30% of parents/guardians reported enrolling their child in primary 1 early. This finding highlights the need for low-cost, high-quality learning environments for pupils who are not yet ready to enter primary school.

There is a need for further research explicitly studying learning over time, as pupils progress through the foundational years. This type of longitudinal study would allow researchers to better understand the pathways through which learning reduces repetition rates. They could also examine how the quality of early learning environments interacts with pre-primary education and later outcomes, such as the primary school completion rate.

Finally, overcrowding of primary 1 classes (resulting from the underreported repetition found in this study) is a significant barrier to good-quality instruction for all learners. It directly increases the amount of effort that the education system requires to produce one completer, thus increasing the cycle-cost of primary school.

Research Question 5: Parent/guardian expectations, knowledge, and spending on education

This section reports on parents'/guardians' expectations and knowledge about early learning. Parents/guardians were asked a series of questions about their expectations, beliefs and decision-making regarding both pre-primary and primary 1 learning.

Parent/guardian expectations of learning in pre-primary

When asked about their expectations of what pupils learn or should learn in pre-primary school, as shown in ***Table 13,*** the most-cited responses were academic in nature, including how to read and write and learn English. However, other responses around the socio-emotional domain of early learning were also noted, suggesting that parents/guardians may have a well-rounded view of the types of learning that can take place at an early age in the pre-primary setting. Although most parents/guardians cited that they got this information from their own experience, as shown in ***Table 14,*** many also obtained it from school, neighbours, or observation of others. This suggests many avenues by which parents could receive this information.

Table 13. Parent/guardian expectations of children's learning in pre-primary school*

Parent/guardian response	Percentage	*n*
How to read	58.7%	782
Practice writing	45.4%	598
Learn English	35.9%	473
Learn numbers	29.5%	415
Learn letters	28.6%	392
How to behave / Learn manners / Grow up	28.6%	361
Play games	24.4%	317
Sing songs	18.3%	260
Make friends / Be with friends	17.8%	220
Speak	16.4%	222
Draw pictures	9.1%	119

*Includes hidden pre-primary; note that interviewees were allowed multiple responses, so the totals do not add up to 100%.

Table 14. Sources of information about what children learn in pre-primary*

Parent/guardian response	Percentage	*n*
My experience	35.5%	497
From school	29.3%	411

Table 14. Sources of information about what children learn in pre-primary*

Parent/guardian response	Percentage	*n*
Observing others	28.7%	346
From neighbours	26.4%	353
Radio or TV	5.3%	55

*Includes hidden pre-primary; note that interviewees were allowed multiple responses, so the totals do not add up to 100%.

Parent/guardian decision-making about pre-primary education

To better understand parents'/guardians' views of pre-primary school, parents/guardians were asked about their decision-making regarding choosing to send or not send their child to pre-primary school. ***Table 15*** and ***Table 16*** display the responses.

Similar to the reasons parents/guardians gave for sending their children to primary 1 early (discussed above), the most cited reason for sending the child to pre-primary school was to learn (73%), followed by 'the child was ready' (17%).The most cited reason for not sending the child to pre-primary was financial (62%).This finding aligns with results from another recent study by Cambridge Education (2017).

Table 15. Reasons parent/guardian sent child to pre-primary school*

Parent/guardian response	Percentage	*n*
To learn	72.6%	349
Child was ready	16.8%	84
Child was the right age	16.6%	76
It is expected	11.6%	60
Suggestion from others	8.0%	38
Child wanted to go	7.6%	38
I need to work	2.2%	9

* These data omitted hidden pre-primary attenders. Parents/guardians were not asked about it, as their perception was that their children were currently attending pre-primary and the question would have caused confusion.

Table 16. Reasons parent/guardian did not send child to pre-primary school*

Parent/guardian response	Percentage	*n*
Financial reasons	61.5%	469
No school nearby	26.7%	219
Other	3.6%	26

Table 16. Reasons parent/guardian did not send child to pre-primary school*

Parent/guardian response	Percentage	*n*
Child didn't need it	2.5%	26
Child was living with a relative	2.3%	19
Child was sick/sickly	2.2%	15
Child didn't want to go	0.6%	4
Do not know	0.6%	6

*These data omitted hidden pre-primary attenders. Parents/guardians were not asked about it, as their perception was that their children were currently attending pre-primary and the question would have caused confusion.

Parent/guardian knowledge of age of enrolment in school

In order to learn about parents'/guardians' knowledge regarding the age of enrolment in school, we asked their opinions on beginning both pre-primary and primary school ***(Table 17).*** Most parents/guardians reported that children should start pre-primary school at 3 or 4 years old, which correlates well with the 3-year pre-primary or nursery school setting (top, middle, baby classes).

When we asked for a response other than age, the top responses about when to send the child ***(Table 18)*** were when the child speaks well (64%), follows directions (43%), and plays well with friends (29%).

Regarding primary school, surprisingly, only 38% of parents/guardians reported that pupils should be enrolled at 6 years, with 23% responding 7 years ***(Table 19)***. A sizeable proportion (31%), however, responded that a child should start before the official age of enrolment, at 5 years or younger. Most parents/guardians reported getting their information about beginning school from their own experience ***(Table 20),*** which aligns well with the percentage of parents/guardians who reported having attended some primary school (84%).

Table 17. Age at which parents/guardians think a child should start pre-primary school*

Parent/guardian response	Percentage	*n*
2 years or less	5.4%	62
3 years	41.1%	507
4 years	34.9%	494
5 years	13.5%	185
6 years	2.3%	33
7 years	0.5%	7
Don't know	2.3%	28

*Includes hidden pre-primary.

Table 18. When a child should start pre-primary school, other than age*

Parent/guardian response	Percentage	*n*
Speaks well	63.5%	844
Follows directions	43.3%	521
Plays well with friends	29.0%	355
Writes	21.4%	258
Emotionally mature	17.6%	272
Child asks to go	15.3%	192
Big enough in size	14.7%	205
Uses toilet alone	12.3%	168

*Includes hidden pre-primary.

Table 19. Age at which parents/guardians think a child should start primary 1*

Parent/guardian response	Percentage	*n*
3 years	1.5%	16
4 years	7.4%	76
5 years	21.9%	267
6 years	38.2%	526
7 years	23.1%	332
8 years	4.3%	54
9 years	1.1%	14

*Includes hidden pre-primary.

Table 20. Source of information about age at which child should start primary 1*

Parent/guardian response	Percentage	*n*
My experience	**52.1%**	**681**
From school	24.4%	343
Observing others	22.5%	289
From neighbours	22.3%	323
Radio or television	8.2%	85
It's the law	6.2%	52

*Includes hidden pre-primary.

Discussion of findings, Research Question 5: Parent/guardian expectations and knowledge of education

Together, the findings from the parent/guardian reports of expectations and knowledge of education, as well as the findings from parent/guardian reports of enrolment and repetition, highlight that parents/guardians are not only knowledgeable about children's learning, but also are proactive in their approach to gaining education for their children. Parents/guardians realize that their young children are not expected to learn exclusively academic information in pre-primary and should enrol in pre-primary at an appropriate age (3–5 years). Due to financial constraints (and lack of a free government pre-primary option), parents/guardians send their children to primary 1 in order to learn and, in their own perception, prepare them for eventually completing primary 1 after a few years of repeating.

Summary of findings from all research questions

The aim of the national school study was to investigate the issue of repetition in the early grades in Uganda by comparing multiple sources of information. In addition, we sought and explored parents'/guardians' perceptions of educational matters, such as age at enrolment and decisions about pre-primary and primary school, to complement the findings related to repetition and enrolment.

The following key results were found.

Higher percentages of under-age and over-age pupils in primary 1 were found through parent/guardian interviews than in school records.

Parents/guardians reported higher under-age (11%) and over-age (43%) enrolment in primary 1 than school records suggested would exist. Classroom registers, head teacher registers, and EMIS records all reported higher proportions of target-age pupils in primary 1 than either over-age or under-age (between 57% and 62%).

Parent/guardian reports of age of enrolment showed surprisingly high percentages of pupils enrolled in primary 1 when younger than 6 years.

Although the majority of parents/guardians enrolled their child in primary 1 at the target age, a large percentage (almost 30%) of parents/guardians enrolled their child at 5 years or younger.

Parents/guardians and teachers reported much higher repetition rates than we found in EMIS or school records.

Records provided by head teachers, classroom registers, and EMIS data showed relatively low rates of repetition. The pattern indicated that as the source of information grew closer to the child, the rate of repetition increased. Interviewed teachers reported a repetition rate of 41% and parents/guardians revealed a repetition rate of 52%. Data from school records showed much lower repetition rates – between 10% and 15%. One potential explanation for

this finding is that school officials may underreport repetition in response to the automatic promotion policy introduced with the Education Act of 2008.

The prevalence of over-age learners was partly created by repetition (not just late entry).

Repeaters in primary 1 were, on average, 7.3 years old, while non-repeaters were 6.6 years old. More repeaters were over-age than target-age or under-age, which was true for both parent/guardian reports and teacher reports in the sample. The degree of aging in the system may be even higher than that, as repeaters are more likely to enter school at a younger age, and younger-age entrants are more likely to repeat.

Parents/guardians and teachers expected between 20% and 40% of pupils to repeat primary 1.

Parents/guardians and teachers, before the end of the school year, held expectations regarding holding pupils back in primary 1. The rates of expected repetition were higher than repetition rates found in officially reported data. As noted above, approximately 41% to 52% of this sample of pupils were discovered to have already repeated primary 1.

Although the pre-primary enrolment rate found in this study (34%) is higher than has been reported elsewhere, access to pre-primary education is nevertheless extremely low.

Most children in Uganda (66%) are not exposed to pre-primary education prior to entering primary school. The top reasons cited from parents/guardians for not sending their child to pre-primary were financial (62%) and lack of access (27%), indicating that the current private pre-primary education system is not feasible for most families.

Attending pre-primary was associated with a lower chance of repeating, and entering primary 1 early was associated with a higher chance of pupils' repeating.

Children who did not attend pre-primary school were 3.8 times as likely to repeat as pupils who did attend pre-primary school, even after controlling for other variables such as SES, gender, age at enrolment, and disability. This protective effect of pre-primary schooling has potentially large implications for over-enrolment, dropout rates, and system efficiency in Uganda. Additionally, pupils entering primary 1 before the official age of enrolment (before they were developmentally ready) were 1.7 times more likely to repeat.

Pupils reported as having a disability were more than twice as likely to repeat primary 1 than pupils who were not reported as having a disability.

In the low-resource educational setting of Uganda, pupils with disabilities were likely not receiving the differentiated instruction or materials that would be required for them to progress and learn at the rate of their peers.

Pupils from low SES environments were less likely to attend pre-primary school.

Given that pre-primary services are provided mostly by the private sector and may be costly, pupils from disadvantaged backgrounds were not able to profit from the positive impact pre-primary offers. Additionally, other studies have found that poorer areas have fewer pre-primary providers, regardless of type.

Parents/guardians were knowledgeable about children's learning, proactively sought education for their children, and perceived early enrolment as preparation for completing primary 1.

In absence of a pre-primary option, some parents/guardians prioritized education even when their children were not old enough to yet complete primary 1. They sent them to school early but also expected them to repeat.

Taken together, the high percentages of non-target-age pupils, high repetition rates, and high expectations of repetition by parents/guardians and teachers highlighted that school officials were underreporting repetition and were reporting age inaccurately. When we asked about repetition, parents/guardians and teachers indicated that pupils may need to repeat when they have not learned enough, suggesting low adherence to the automatic promotion policy. Some parents/guardians were also ignoring the official age of enrolment for primary 1, instead valuing the exposure to education that their children might receive by enrolling them in primary 1 early.

The findings also highlighted the demand for pre-primary education. Exposure to early learning environments prior to primary 1 clearly benefits pupils, by decreasing repetition likely caused by low levels of learning, as shown by our parent/guardian and teacher responses. More access to pre-primary would also decrease overcrowding in primary 1 classrooms, allowing for teachers to focus on developmentally appropriate and high-quality instruction.

Finally, attention should be given to vulnerable populations, including pupils reported as having a disability and pupils from lower-SES households, who are at a greater risk for repetition and lack of pre-primary exposure.

Limitations

The current study effectively used a new methodology to gain national estimates of primary 1 repetition and pre-primary enrolment, and to examine the relationships among the factors

affecting the efficiency of pupils moving through primary 1. However, the national school study had several limitations.

First, the study did not include any measure of the *quality* of pre-primary or primary 1 classrooms attended by sampled pupils. The level of education quality experienced by pupils in the early grades plays a central role in learning outcomes, which in turn is linked to repetition. We might have found a stronger protective effect of pre-primary if we had been able to incorporate pre-primary quality as a mediating factor in the relationship between pre-primary and repetition.

Second, classroom registers, head teacher registries, and EMIS forms were not available to be reviewed at every school. The comprehensiveness of school record data is a problem, with 14% of schools in the sample having no available records at all. The incompleteness of school data records had repercussions in terms of comparability.

A third limitation relates to the identification of pupils with disabilities. The study did not directly screen learners for disabilities, instead relying on parents'/guardians' reports of their child's disability status. Nor did the study stratify for students with disability. Two problems resulted. First, parents/guardians may have had an incentive to under-report disability, if there was any stigma attached to it. Second, parents/guardians may have been unaware of a child's disability because of limited local resources for proper screening and diagnosis. Therefore, the incidence of disability reported here (9%) is likely lower than the reality, and its relationship with pre-primary enrolment and primary 1 repetition may have been insufficiently captured.

3. Objective 2: Impact on Policy and Financing

In the previous section, we used data from parents'/guardians', teachers', and schools' perspectives to examine many issues affecting the Ugandan education system's internal efficiency. The issues examined (repetition rates, pre-primary exposure, perceived lack of learning, and other unmeasured factors) were hypothesized to impede completion of primary school, and to increase the cost per completer.

For Objective 2, to address the impact on education sector policy and financing more directly, we reviewed the same factors using different methodologies. For this step, we (1) analysed a macro set of data (i.e. from countries in the same region as Uganda), (2) devised a simulation for Uganda itself, (3) read existing policy documents, and (4) carried out key-informant interviews.

3.1 Regional Comparisons and Contrasts

Some other countries in the region did not display the same education inefficiency factors as observed in Uganda. ***Table 21*** below lists the estimates we found for the primary school completion rate, pre-primary gross enrolment ratio (GER), ratio of actual primary 1 pupils to the appropriate population of primary 1 pupils, excess cost of primary school, and expenditure of primary school as a percentage of the entire education expenditure for Uganda, Tanzania, and Kenya.

First, the table shows Uganda as having an extremely **high ratio of children officially (or reportedly) enrolled in primary 1.** According to the last 5-year average of data reported to the

World Bank via UIS, about 60% more children were enrolled in primary 1 than were in the population that should have been in primary 1. This type of situation inflates the cost of primary schooling. In Tanzania and Kenya, these proportions were 0% and 10% respectively.

Next, the table shows that this heavy over-enrolment in Uganda in the early grades works against completion of primary school, as evidenced by the mean primary education completion rate of 56% in Uganda. By contrast, Tanzania's completion rate was 76% and Kenya had universal completion.

The table also shows an **index of excess cost of primary school.**[3] This value is an instantaneous, non-cohort measure of the effort that the education system expends to produce a completer. In an ideal system, the number should be 0. The table shows that Uganda's excess costs were in the range of 114% of what the system should otherwise cost. Neither Tanzania nor Kenya reached the ideal number of 0%, but they came close, possibly because neither had the strain of excessive early enrolment shown in Uganda.

Contrasts of the **pre-primary gross enrolment ratio** showed that both Tanzania and Kenya were affording their children considerably more pre-primary opportunity than Uganda. That investment is likely a main reason for the low primary 1 over-enrolment ratio and the low excess cost of primary school in those countries as compared to Uganda. It may not be the sole reason for the better internal efficiency of the systems in Tanzania and Kenya, but it is surely a contributing factor.

Finally, in Uganda, the high enrolment bulge in primary requires much **expenditure on the primary system** (58% as compared to 49% and 36% in Tanzania and Kenya respectively). In Uganda, over-enrolment in primary displaces other expenditures in the education system. In other words, it forces an over-expenditure in primary schooling, yet does not generate a satisfactory primary school completion rate.

Table 21. Contrast of education efficiency estimates in regional countries

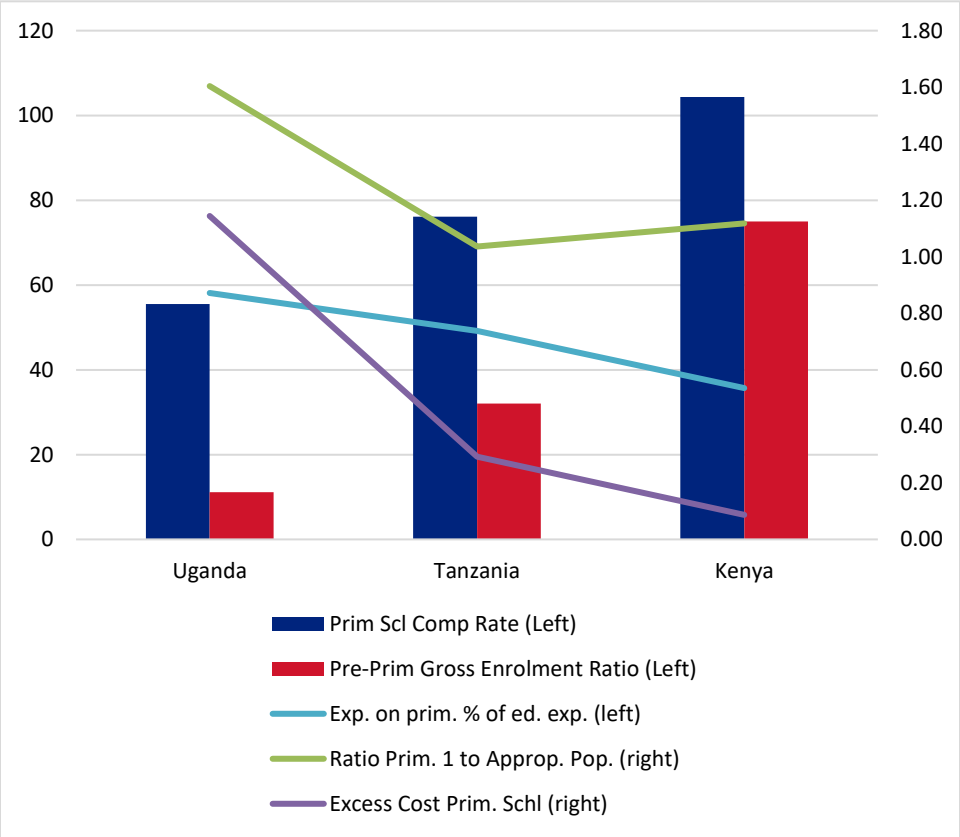
Country	Ratio of primary 1 to appropriate population	Pre-primary gross enrol-ment rate	Excess cost of primary school	Expenditure on primary as percen-tage of education expenditure	Primary school completion rate
Uganda	1.6	11.1%	114%	58%	56%
Tanzania	1.0	32.0%	29%	49%	76%
Kenya	1.1	75.0%	9%	36%	104%

[3] We calculated the index of excess cost of primary school by taking the total enrolment in primary school and dividing it by the number of pupils in the last graduating year of primary school. Then we standardized by the number of years in the primary school system.

Source: Data reported to the World Bank via UIS, average of last five years for which data were available.[4]

Figure 10 shows the same data in graphical form, to display how these factors move together. The 'movement together' of the factors is not perfectly mathematical, however. Rather, it is a social phenomenon. Nor are the factors all necessarily causal. However, it is quite evident that the factors do move together, and that they form a cohesive complex that causes inefficiency. That is, as pre-primary enrolment increases (red bar), the over-enrolment in primary 1 decreases (green line), and so the completion rate increases (blue bar), and the cost of the effort to increase enrolment goes down (purple line; blue line). All of these interactions lead to decreased expenditures on primary education (as well as a decrease in crowding out of other forms of education expenditures).

Figure 10. Indicators of internal efficiency of primary schooling and access to pre-primary schooling



*Source: Graphed from Table 21. Note that pure ratios use the vertical axis to the right.

We also found it instructive to compare countries in the region that had similar issues. We gathered the past two years of primary 1 EMIS data, then calculated official and unofficial

[4] For inter-country comparisons, we purposefully used data which is reported to the World Bank via UIS, which undertakes to make sure that the data are reasonably comparable. If we had used country-specific data for one country, we likely would also have encountered country-specific data for the others that would have needed to be examined. Turning the research into a regional research project was not within the scope of the current study. Also, to smooth out spikes or inconsistencies in reporting, we took the average of the last 5 years' worth of available data.

repetition rates. We also estimated repetition rates, primary school completion rates, GIR into primary 1, and GER for pre-primary. All of these are shown in ***Table 22.***

Table 22. Efficiency parameters

Parameter	Uganda	Madagascar	Ethiopia
Estimated official repetition, primary 1*	4%	23%	29%
Alternative comparative method estimation, primary 1 repetition*	34%	48%	40.2%
'Aging in place' in primary 1*	1.3	1.6	1.0
Estimated repetition from prior section	As high as 52%	N/A	N/A
Official gross intake ratio (GIR)*^	138%	184%	124%
Alternative comparative method of estimating intake ratio*^	101%	136%	96%
Primary school completion rate	56%	70%	55%
Gross enrolment ratio pre-primary	11%	15%	19%

*EMIS data on enrolment by age and grade, sourced directly from countries; *^combination of courses; no symbol is World Bank via UIS data.

First, because we did not have the deep school-and-parent survey data for the other countries that we had for Uganda, we developed an alternative measure for estimating repetition. It depends on *actually* tracking the movement of children from primary 1 to primary 2. When we prepared the calculations, we discovered the rate of repetition in primary 1 was much higher than what was being officially reported, usually by 20 to 30 percentage points. In other words, the estimate was fully consistent with the findings from the school study in this report.

The same data allowed us to calculate the average age of children in each grade, and to ascertain how much aging in place was occurring in primary 1. In Uganda, pupils were reported to age 1.3 years. Although it is true that age–grade data in many countries are unreliable, the data are strongly suggestive. In principle, with a repetition rate as low as those reported, the aging in place should be 1 plus the repetition rate, approximately. (In a country with zero repetition, children should age exactly one year in primary 1.) However, the data in Table 22 show that aging in place was much higher (except in the odd case of Ethiopia). This result supports the hypothesis that the repetition rate must be high – much higher than the official estimate. For Uganda, recall that we had an alternative estimate of repetition, thanks to the national school study. In the Findings section of this report, we noted estimates of repetition as high as 52%, according to parents/guardians. Those figures are broadly consistent with the notion that students age 1.3 years in primary 1.

Next, most of these countries reported official GIRs of approximately 1.4 to 1.5. These same ratios have been reported year after year, which is not possible, as the countries would eventually run out of never-enrolled pupils. Neither can the alternative explanation for permanently high GIRs be true – i.e. that the system is permanently enrolling pupils who are under-age or over-age. If a pupil were to enrol too young in one year, it would increase the GIR that year, but it would reduce it the next year. Similarly, if students enrol too old, they will bulk up

the GIR for the year in which they enrol, but they will similarly reduce it for the year before they enrolled.

In a 'normal' steady state, then, the GIR should stabilize to about 100%. Instead, the fact that they have been reported as high as 140%, year after year, is an overlooked but notable logical inconsistency in these countries' systems. It also is a strong indicator of hidden repetition: Students enrol as new twice; the second time, they are repeaters by definition, but instead they are reported as new again. Such high permanent intake ratios are a clear sign of an internal efficiency problem.

When we took into account the hidden repetition, and used it to discount the exaggerated GIR, the GIR dropped to a much more logical 1.0, or near that. In Uganda, the average gross intake of the past five years of World Bank data was approximately 138%. However, re-estimating the intake led to approximately 100%, which is the only value consistent with the likely reality.

Table 22 shows Uganda, Madagascar, and Ethiopia as having four factors in common. First, when we estimated repetition rates using a 'flow' or 'actual tracking' method as described above, the rates were much higher than official reports. Second, our subsequently re-estimated rates of gross intake became much more reasonable, confirming the alternative estimate of the repetition rate. Third, all three countries showed very low provision of pre-primary education opportunities for children. Finally, all three countries had low primary school completion rates.

Although these four factors cannot be said to be mathematically causal with each other, their conjunction is very strong, especially when we contrast the experience of countries not having a similar problem, such as Tanzania or Kenya. We believe that together, these factors drive very low internal efficiency in these education systems, leading to completion rates stalled at low levels, and levels of expenditure on primary education that are much higher than the output justifies.

3.2 Estimating the cost of over-enrolment to Uganda

This section describes a demographically driven cost-projection model (model details are available in Crouch & Kikombo, 2015). This model, tailored for this study, was developed to determine the cost to the GOU of over-enrolment in primary school, as well as savings that could accrue if the MoES were to invest in decreasing the repetition rate.

Parameters of the model

Pre-primary GER

We calculated the 2016 pre-primary GER from several years' worth of GOU EMIS enrolment and population data. Our analysis of historical data showed that pre-primary GER was increasing annually by 16%. Conservatively, we used half of that value (8%) in our projection model. We also set the pre-primary GER to an upper limit of 60%. This choice reflected our assumption that upwards of 40% of the families in Uganda were unlikely to be able to afford pre-primary education without financial help. Next, we examined the impact of a GOU investment in a subsidy for pre-primary, and made an assumption that pre-primary enrolment would grow by an additional 3% per year, for a total growth rate of 11% per year. In addition, national census data (Uganda Bureau of Statistics, 2017) indicated that the underlying population also was growing. Under these parameters, we set an upper boundary for the model of 80% for the pre-

primary GER. Again, we chose a conservative assumption that under these circumstances, 20% of the country would not attend pre-primary even with the subsidy.

Primary 1 Repetition Rate

The model established the 2016 primary 1 repetition rate value based on several years' worth of GOU EMIS data. As shown in ***Table 23,*** the repetition rate decreases beyond 2016 as the pre-primary GER increases. The logic for lowering the repetition rate beyond 2016 was that it should decline yearly in proportion to the growth of the intake into pre-primary, until it reaches a lower limit of 7%. Because the subsidy-induced growth in pre-primary intake was set at 3% (as indicated in the prior paragraph), the repetition rate drops by 3% annually until it reaches a value of 7%. The resulting projections up to 2025 are shown in Table 23**.**

Table 23. Increased access to pre-primary education and decreased repetition rates

	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Pre-primary enrolment (x1000)	565	638	721	813	918	1,027	1,148	1,283	1,433	1,600
Pre-primary gross enrolment rate	0.16	0.17	0.19	0.21	0.23	0.26	0.29	0.32	0.35	0.39
Primary 1 repetition rate	0.34	0.31	0.28	0.25	0.22	0.19	0.16	0.13	0.10	0.07

Calculation of effort of primary completion

Next, we wanted to quantify the degree of inefficiency caused by primary over-enrolment. For this value, we chose as a proxy the number of instantaneous pupil years, or pupil years of effort, that it would take the system to produce a primary-level completer. We adopted primary 7 enrolment as a proxy for primary level completers, because primary 7 is the last grade in primary. Accordingly, the pupil years of effort needed to complete was the total enrolment in primary divided by enrolment in primary 7. The primary 1 and primary 2 through 7 enrolment projections generated by the model used standard grade transition rate methodologies (see Jacoby, 1959; Thonstad, 1980). For the current over-enrolment rate in Uganda, as shown in the next section, we estimated the inefficiency at approximately 13.78 pupil years of effort for producing one primary 7 completer.

Current, ideal, and investment models for enrolment

Table 24 shows a projection of pre-primary and primary 1 through primary 7 enrolment as repetition rates progress without intervention. Also shown are the number of repeaters and the value for instantaneous pupil years, as described above**.** Table 24 also presents these data for the theoretically ideal situation – i.e. one in which there is no repetition or dropout. The difference between the instantaneous pupil years of the current situation and that of the ideal situation is also shown.

Lastly, Table 24 presents the same data for a scenario in which investments in pre-primary and primary education have been made. In this model, pre-primary has been expanded and primary repetition and dropout reduced to a reasonably low level. These changes allow for subsequent improvement in the flow of pupils through the lower grades of primary, according to parameters from both Uganda's and other countries' efforts to improve the quality of education in the primary grades.

In the **current enrolment model**, pupil effort is estimated at 13.78 years for 7 completed grades of school and persists over time, as shown in Table 24.

In the **ideal enrolment model**, in which there is no primary repetition or dropout, the estimate of pupil effort is set at approximately 7.8 years for 7 grades of school. This value is not exactly 7 because the enrolment projections for the ideal situation were drawn from the official population projections for pupils of primary school age. Even in an ideal system, not as many pupils leave primary 7 as entered pre-primary because unfortunately, the death rate even for young age cohorts in Uganda is still substantial. As one can see in Table 24, the difference between the pupil years of effort in the *current* situation and those of the *ideal* situation is close to 6 years, meaning that primary-level pupils who reach primary 7 level in Uganda currently take almost twice as much effort to do so than would be the case in the ideal situation.

In the **investment model,** high-quality pre-primary is expanded, and primary repetition is reduced (but not altogether zero). As shown in Table 24, the values start at 13.78 in 2015 and drop to 9.03 in 2025. This means that by the end of the period, it takes 9 years of effort for a pupil to finish 7 levels of school. The policy of automatic promotion may then work as intended, if investments are made.

The difference between the pupil years of effort values and equivalent values of the *current* situation starts at 0.00 in 2015 and increases to 4.18 in 2025, representing the gain in efficiency. The gain of efficiency modelled is comparable to what some other countries achieve, such as Kenya and Tanzania, as shown in the analysis in the previous section.

Table 24. Enrolment models											
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
Current Enrolment											
Pre-primary	500,000	549,629	603,986	663,499	728,638	799,911	870,585	947,021	1,029,644	1,118,896	1,215,255
P1–P7	8,854,368	9,192,502	9,527,260	9,858,817	10,188,521	10,534,145	10,883,841	11,230,069	11,560,220	11,871,988	12,169,325
Primary repeaters	1,720,026	1,730,342	1,805,505	1,871,221	1,934,128	1,999,128	2,066,745	2,132,261	2,194,814	2,254,239	2,310,984
Pupil years of effort	13.78	13.73	13.61	13.38	13.50	13.67	13.81	13.70	13.51	13.34	13.21
Ideal Enrolment											
Pre-primary	1,172,755	1,198,572	1,224,554	1,250,685	1,276,958	1,303,356	1,318,831	1,333,812	1,348,275	1,362,192	1,375,538
P1-P7	7,213,055	7,405,444	7,600,759	7,798,956	8,000,034	8,203,949	8,366,559	8,529,579	8,692,948	8,856,566	9,020,371
Primary repeaters	0	0	0	0	0	0	0	0	0	0	0
Pupil years of effort	7.79	7.76	7.74	7.72	7.70	7.68	7.62	7.57	7.51	7.46	7.41
Difference in pupil years with current	5.99	5.97	5.87	5.66	5.80	5.99	6.18	6.13	6.00	5.88	5.81
Enrolment with Investment											
Pre-primary	500,000	564,960	638,149	720,581	813,396	917,865	1,026,823	1,148,132	1,283,118	1,433,233	1,600,080
P1-P7	8,854,368	9,014,011	9,266,516	9,581,381	9,937,526	10,327,435	10,709,457	11,067,694	11,390,078	11,698,961	12,035,700
Primary repeaters	1,720,026	1,568,629	1,438,377	1,309,322	1,176,943	1,040,546	896,570	752,526	612,932	521,449	445,573
Pupil years if effort	13.78	13.64	13.42	12.97	12.53	11.92	11.16	10.25	9.59	9.26	9.03
Difference in pupil years with current	0.00	0.10	0.19	0.41	0.97	1.74	2.65	3.45	3.92	4.09	4.18

Cost and savings projection model

To cost the inefficiency of the current model of enrolment, we examined the cost of primary education under the current model and subtracted the cost of primary education under the ideal model. ***Table 25*** shows the estimations at each step. We calculated the estimations using the current enrolment model of 2015.

The cost of one year in primary school for one pupil in 2015 was estimated to be approximately UGX 167,884 (US$46). When we multiplied this estimate by the additional approximately 6 years of pupil effort that it takes to create a primary 7 completer, the calculation of inefficiency was UGX 1 million (US$274) per primary 7 pupil. When we multiplied the inefficiency per pupil by total enrolment in primary 7, the cost of the inefficiency was UGX 646.4 quadrillion (US$177.1 million) in 2015, or approximately 43% of the total estimated GOU expenditure on primary education that year.

This inefficiency cost, if unaddressed, gradually increases to UGX928.5 quadrillion (US$254.4 million) in 2027. Over these 12 years, the cost of this inefficiency adds up to UGX 10.2 quintillion (US$2.8 billion). The main point from this exercise is not that the cost of the inefficiency adds up to *exactly* UGX 10.2 quintillion (US$2.8 billion), but rather, that it is a very costly inefficiency, on the order of UGX 3.7 quintillion – 11.0 quintillion (US$1–3 billion). Please note that, subsequently, we will present calculations in US dollars for convenience.

Table 25. Cost of inefficiency

Cost factor	Estimation
Cost of one year in primary school for one pupil in 2015, under current model	~US$46
Pupil years of effort for one primary 7 completer in 2015, under current conditions	13.78 years
Cost of current pupil years of effort for primary 7 completion in 2015, under current model	~US$634
Cost of the inefficiency per pupil for primary 7 completion in 2015 (additional pupil years of effort) under current model as compared to ideal model	~US$274
Cost of inefficiency for all primary 7 completers in 2015, under current model as compared to ideal model	~US$177.1 million
Cost of inefficiency for all primary 7 completers over 12 years, under current model as compared to ideal model	~US$2.8 billion

Access to pre-primary and improved quality of primary have costs as well. Furthermore, mere improvements in pre-primary access will not affect change. We conservatively assumed that kindred investments would be needed in primary school as well.

The measures that are modelled, costed, and presented in ***Table 26*** and ***Figure 11,*** are:

1. GOU subsidies to private pre-primary providers for the expansion of quality pre-primary,

2. Improved book provision,
3. In-service teacher education,
4. Teacher support or coaching,
5. Improved school management and governance, and
6. Systems improvements.

The projected GOU subsidy to private pre-primary expansion makes several assumptions. First, it assumes a steady growth of private provision beyond the current level. Second, it assumes that subsidized-induced growth is funded by the GOU at 67% of the unit cost of primary (or, alternatively, that the government directly provides pre-primary care at 67% of the per capita cost of primary care).[7] Finally, the nature and cost of measures 2 through 6 are premised on current early grade reading projects supported with development partner funding in Uganda. The assumption is that the GOU will take responsibility for financing and implementing – at scale – the work that development partner projects are currently providing.[5]

Over the 12-year period from 2015 to 2027, the modelled cost of the interventions in primary education (row 6) adds up to approximately US$941 million. The impacts of these investments on increased access to quality pre-primary education and reduced repetition (row 4) are shown in Table 25 as well. The savings can be calculated by subtracting the current cost of primary education (row 1) from the cost of education after pre-primary expansion (row 4).

To summarize, as shown in Figure 11, the total savings across 12 years is approximately US$996 million, which is US$54 million more than the 12-year cost of the investments.[6] The investments in primary education have the potential to pay for themselves in 12 years' time, a remarkable finding. Currently, the investments made by the GOU do not translate into efficiency in the education system. *If investments are made to expand quality pre-primary education and to improve the provision of quality primary education, those investments can pay for themselves in terms of the improved efficiency that those investments achieved.*

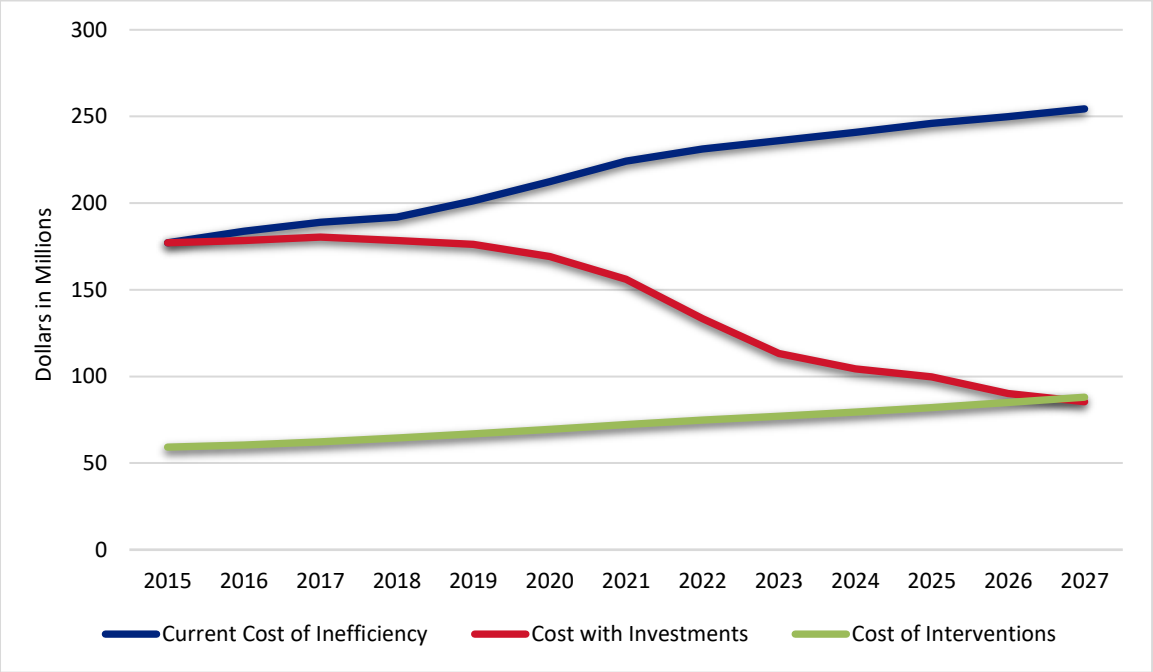
Please note that this is a heuristic but reasonable exercise. All the data we used were Ugandan or were plausible for Uganda given reasonable comparisons. We do not know that the exact amount of investment used in the model would result in the exact level of pre-primary expansion projected by the model. Nor do we know that the level of investments used by the model to reduce primary repetition would in fact reduce repetition by the amount projected. The point of this analysis was to raise awareness among GOU officials and donors about the likely impact such investments could have and to learn what investment might be needed to affect these changes.

[5] Note that the assumption of GOU subsidization is not necessary: Pre-primary education could be provided in public centres through direct costs. But if that were the case, the efficiency could be considerably lower. We have simulated what we believe would provide the highest *fiscal* efficiency, namely partial and targeted subsidization, improving over time.

[6] Because pre-primary enrolment in 2015 was already being paid for by non-state actors, the model applied these government costs only to new pre-primary students coming into the system in 2016 and beyond. In this regard, we were trying to mimic the use of government money to encourage the expansion of high-quality pre-primary education using public–private partnerships.

Table 26. Cost projections															
		2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	Total
1	Student years to completion without investments	13.78	13.73	13.61	13.38	13.50	13.67	13.81	13.70	13.51	13.34	13.21	13.11	13.04	
2	Cost of the inefficiency (in US$ millions)	177.1	183.7	188.9	191.9	201.3	212.4	224.2	231.2	236.0	240.8	246.0	249.8	254.4	~ US$2.8 billion
3	Student years to completion with investments to increase pre-primary access and reduce primary repetition	13.78	13.64	13.42	12.97	12.53	11.92	11.16	10.25	9.59	9.26	9.03	8.78	8.63	
4	Cost with additional investment in pre-primary and reduced repetition (in US$ millions)	177.1	178.5	180.4	178.4	176.2	169.2	156.1	133.3	113.3	104.4	99.7	90.1	85.4	~US$1.8 billion
5	Net loss of inefficiency ('savings') (in US$ millions)	0.0	5.2	8.5	13.5	25.1	43.1	68.1	97.0	122.8	136.4	146.3	159.6	169.0	
6	Cost of primary interventions (in US$ millions)	59.2	60.4	62.2	64.4	66.9	69.5	72.2	74.8	77.1	79.4	82.0	84.9	88.0	~US$941 million

Figure 11. Current cost of primary education compared to cost with investments and cost of interventions



3.3 Policy Review and Interviews

The micro issues covered in detail in the previous sections of the report, as well as the macro issues covered here in Section 3, are already being touched upon in the existing policy discourse in Uganda. However, the data presented here demonstrate the urgency of the issues. An important aim of this report is to strengthen the debate on the importance of the foundational years of school in the efficiency of education provision. This section recounts the review of 13 policy documents (see ***Annex 3*** for full source list) and key informant interviews.

Policy discussions and the data we summarize here are offered in terms of the obligations on United Nations and Bilateral and Multilateral Development Partners, described within 'The National Integrated Early Childhood Development Policy for Uganda' (NIECD; see Ministry of Gender, Labour, and Social Development, 2016, p. 31) to:

1. Conduct advocacy for ECD and mobilize adequate resources for investment in ECD, implementation of the NIECD Policy of Uganda and other ECD programmes.
2. Provide funding for ECD programmes and activities at the national and local government levels.
3. Provide technical support and build capacity of all stakeholders to implement the NIECD Policy and Action Plan of Uganda and other ECD programmes.
4. Build and strengthen linkages and collaborations and partnerships at international, national and local government.

Common themes emerging from the documents and interviews are the following.

Although pre-primary services have expanded in Uganda in the past decade, they are still largely privately funded and privately led. As a result, pre-primary provision levels are low. Furthermore, because pre-primary expansion depends on mostly private funding, enrolment may reach natural limits, thus not reaching those vulnerable children who would both need and benefit from it the most.

Dropout and repetition are sometimes confused in policy discussion. Dropout rates are not high in the early grades in Uganda. Instead, there is high repetition, a gross overcrowding of the early grades, and a thinning out towards the last grades of primary which results in low completion rates and high cost of completion.

Policies often consist of general statements. They lack quantitative goals for state subsidization, or for the precise, desired mix and type of public–private partnerships, with numerical parameters. The budget speeches and other documents that we reviewed seldom detailed specific spending on pre-primary provision. Some programmes based on international agency funding were mentioned, but we found little or no evidence that they were studied for possible adoption or adaptation to either public or publicly subsidized provision. (An exception was the document on Programme-Based Budgeting for Uganda, which took ECD investment as a case in principle.) This lack of specificity may have occurred because stakeholders did not recognize the direct pecuniary benefits from lowering the costs of completion through a comprehensive approach to improving quality in early primary and provision of quality pre-primary. It is also difficult, but necessary, to think in terms of both the costs and benefits of such an approach. Well-planned investments could help to reduce repetition, improve learning, and resolve the even more difficult issues of language of instruction and later transition to English.

There is a tendency to not acknowledge the possible pecuniary benefits of improved foundation years policy, stemming from its effects on learning and performance. As we have demonstrated, creating a model that considers both the costs and benefits of improved pre-primary and primary provision is not methodologically trivial. Nevertheless, it is important. Stakeholders may fear that providing better (and more) inputs in the lower grades may result in higher per-child costs in those phases. However, these same planners may not recognize that another result of such investments can be lower per-child costs for the primary cycle, as children progress faster and repeat and drop out less. While human-rights advocates have lobbied for pre-primary education, as have economists with a view of long-term returns, few policy makers seem to know about the short-run pecuniary or fiscal savings that could be achieved with higher quality. Countries that have sorted out the foundational years issues, in Africa and elsewhere, typically are able to spend a smaller proportion of their education budgets on primary schooling. This occurs because of the flow efficiencies achieved, even in cases where the per-child cost increases. The issue is covered in more depth in Crouch and Merseth (2017) and in the ‘macro’ comparisons provided in this report.

Policies on provision of pre-primary education are under debate**.** Some proposed policies involve the GOU contracting with community or private service pre-primary providers to expand provision, although these proposals do not receive unanimous support. The time is ripe for more support for targeted policy dialogue, as also referenced in the policy review conducted by Cambridge Education (2017).

The current report, by showing both the micro and macro factors that are associated with access to pre-primary provision, should sharpen the policy dialogue and policy positions

around pre-primary provision. It acknowledges the extensive policy discussion which has taken place, and has been summarized and documented by stakeholders, but points to the need for greater urgency, specificity, and rigor.

4. Policy Recommendations

During this research, we examined (1) the efficiency of early primary and pre-primary education in Uganda, and (2) the impact of inefficiency on primary education sector financing at the national level. The study underscored the need for accurate reporting of data regarding primary education, which would enable decision-makers to better understand the changing nature of the environment in which they are working and to plan for the future. Given the findings from the national school study on enrolment and repetition, and the review of sector spending and related resources, we offer the following policy recommendations related to the efficiency of education provision in the early years in Uganda.

Prioritize support for vulnerable children, including children from low-SES backgrounds and children with disabilities. Our findings showed that pupils with the lowest SES had a higher likelihood of not attending pre-primary and that pupils with disabilities had a higher likelihood of repetition. Parents/guardians reported that financial reasons and access were drivers of lack of enrolment, and other studies have found that poorer areas have fewer pre-primary services. Although our pupils reported as having a disability were not significantly less likely to have attended pre-primary than pupils not reported as having a disability, the pupils were not assessed for disability, criteria and definitions of disability may vary, and the study was not stratified for this purpose. Our study used parent/guardian reports, and interviewers gave the parents/guardians the definition of 'disability' outlined by the MoES if needed. Other studies, such as the research by Cambridge Education (2017), have found that disability does impede exposure to pre-primary and other forms of early childhood care.

Consider remedial support to struggling learners as a short-term measure. As shown in the cost-projection model, investments made in quality pre-primary and early primary education will take time to achieve the desired efficiency outcomes. Meanwhile, learners who are lagging behind their peers in early primary could participate in remedial services to increase their learning achievement. As the improvements in pre-primary and primary quality manifest over time, remediation services would be needed less and less.

Revisit the automatic promotion policy. Our findings clearly showed that school leaders, as well as teachers and parents/guardians, were not adhering to the policy of automatic promotion. As a result, it is likely that schools are reporting inaccurate enrolment and repetition data to MoES in order to be seen as compliant with the policy. However, investments in quality pre-primary and early primary would likely lead to the working of automatic promotion as it was intended.

Invest to expand high-quality pre-primary as well as to improve the quality of primary education. Although our study did not investigate quality per se, substantial global evidence has shown that the quality of pre-primary education is a vital factor in inducing lasting effects on learning outcomes. Higher quality pre-primary may be associated with even lower repetition rates. Moreover, in order to obtain the increase in efficiency (i.e., lower repetition and higher primary completion rates) associated with our cost projection model, investments in high-quality pre-primary and improvements in the quality of primary education must be made. Stated another way, investing in pre-primary education may not make a difference if

attention is not paid to the quality of the education that children receive in the early primary years. Investments might encompass subsidies to private pre-primary providers, more and better books for primary schools, in-service teacher education, teacher support or coaching, improved school management and governance, and systems improvements.

Set minimum standards of quality and strengthen quality assurance. If the GOU and civil society were to define a clear vision and a strong mandate for pre-primary education, it would create an incentive for quality and intensify the appetite for reform in the education landscape. Cambridge Education (2017) underscored the importance of creating an environment which supports various approaches to high-quality pre-primary education, provided by multiple partners. The GOU could define minimum standards of quality, enhance regulation, and thereby lead all stakeholders of early childhood education in the country.

Improve school management and leadership of the early grades. Guide head teachers to prioritize support to teachers of early primary grades. School leadership should be concerned with classrooms with high pupil to teacher ratios, developmentally inappropriate practice in the classroom, lack of teachers trained in early childhood development and education, and the use of appropriate school assignment processes for teachers, Head teachers and school staff should recognize the importance of the foundational years in children's later academic achievement.

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Annex 1: Research Methods

Tool development and adaptation

The instruments developed for this study were based on the tools from the original pilot study. RTI staff reviewed the pilot-phase tools, removing questions that did not lead to useful data in the original study. Following this refining of tools, an adaptation workshop was held on August 14, 2017. The workshop included RTI staff, a local consultant, and members of the Ministry of Education and Sports. Most of the additional revisions to the tools were made to address confusing phrasing, as well as to avoid repetition, in order to lessen teachers' fears that they might be reported on.

Training of data collectors

Data collectors attended training and practised collecting data during one week in September 2016. The classroom portion of the training took place in Kampala, and the practice data collection (one day) at two schools in Wakiso.

Two RTI home office staff members travelled to Uganda to meet with the Uganda team, which included RTI project staff, a local consultant, and the data collection firm Development Research and Social Policy Analysis Centre (DRASPAC). DRASPAC hired 51 data collectors, who were trained by RTI staff on the data collection protocol and on how to use the tablets.

The facilitators reviewed the study purpose, explained the data collection protocol, oversaw practice using the tablets (which had the survey questions loaded in Tangerine®), and reviewed the translation of the tools. As noted above, the training also included one day at schools, where data collectors practised administering the parent/guardian interview, teacher interview, and school records review.

Field data collection

Data collectors departed for full data collection the day after the pilot data collection concluded. The 54 data collectors were divided into 17 teams, based on the language in which they would assess. Three data collectors served on each team. The number of schools each team visited depended on the prevalence of that language. Each team had one supervisor who was in charge of ensuring the team followed their schedule and uploaded their data consistently.

The approach for the school visits was carefully planned and practised during the pilot phase. It included the following research activities:

1. Interview with the head teacher: Upon arrival at the school, the data collection team oriented the head teacher to the purpose of the study and study activities. District education officials had also previously notified the head teacher about the study. The head teacher was then interviewed about details about the primary 1 classrooms and teachers.
2. Identification of the number of primary 1 and special primary 1 streams: Data collectors determined the number of primary 1 classrooms at the schools and planned the selection of pupils accordingly. For example, if a school had two primary 1 classrooms, the data collectors split the number of sampled pupils across the two classrooms (6 pupils from each for a total of 12 pupils). Data collectors also asked the head teacher about the existence of special primary 1 classrooms, i.e. special primary 1 streams to which younger pupils were assigned.

3. Random selection of pupils from primary 1 classrooms: Data collectors followed the RTI protocol for randomly selecting pupils from classrooms to participate in the study. The RTI protocol involved lining up pupils in no particular order, counting the number of pupils, dividing that number by the number to sample, and then skip-counting down the row of pupils. To ensure that pupils were not lining up in a particular order, data collectors had pupils dance or mix themselves in line. The names of selected children, as well as their date of birth and parent/guardian name and contact information, were recorded manually on a paper that was destroyed at the conclusion of the two-day school visit.
4. Preparation of parent/guardian communication: After pupils were identified to take part in the study, letters were prepared for them to take home to their parents/guardians, which provided information about the time for the parent/guardian interview on the subsequent day. If parent/guardian mobile numbers were available, the parents/guardians were also called.
5. Review of classroom-level records: Data collectors asked the head teacher for permission to review records kept at the school on the primary 1 class(es). The sources of the records could be the head teacher's enrolment records, official EMIS records, or the teacher's classroom records. Data collectors reviewed all records available and recorded the number of pupils at each age (ranging from 3 to 9 years old and divided into boys and girls), as well as the number of repeaters, if marked.
6. Classroom headcounts: Other information collected on the first day's visit to the school included the classroom headcount, which simply tallied the number of boys and girls in attendance that day. During the pilot, we found this easiest to do during randomization.
7. Parent/guardian interviews: A small transport stipend was paid (7,000 UGX, approximately US$2) per selected child (only one transport was paid, even if two parents/guardians attended). The person attending the interview had to be knowledgeable about decisions made with respect to the child's pre-primary attendance. During the full data collection, the research team attempted to reach parents/guardians by phone who did not come to the school for the interview. Otherwise, the parent/guardian interviews occurred on the subsequent day. The letters sent to parents/guardians indicated a specific interview time for all parents/guardians, usually 9:00 a.m. Occasionally, some parents/guardians had to wait for their time to participate in the interviews, but the waiting time was generally less than an hour.
8. Teacher interviews: During the team's school visit on the first day, teachers were interviewed about their understanding of the selected pupils' pre-primary experience and asked whether the pupils were primary 1 repeaters.

Annex 2: Calculation of Wealth Indices

Parents/guardians were asked the questions listed in ***Table 27.*** The socio-economic status index was calculated using a linear combination of the factor coefficients (weights) related to each question, based on a Principal Components Analysis.

Table 27. Weights for calculating socio-economic status

Variables	Factor coefficients
Does your home have electricity, including any of the following: solar, gas, wind, etc.?	0.50
Does your family have a television?	0.42
Does your family have a mobile phone?	0.41
Does your family have a radio?	0.41
Does your family have a motorbike?	0.38
Does your family have a motor vehicle?	0.23
Does your family have a bicycle?	0.21

Annex 3: Sources for Impact on Policy and Spending

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