



Exploring Early Education Programs in Peri-urban Settings in Africa

Nairobi Report

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Executive summary

Nairobi has a vibrant private and public education sector at both the primary and preprimary levels. Preschools abound in Nairobi and can be found on many streets and in many neighborhoods. Parents generally give a high priority to sending children to preschool and put a great deal of emphasis on academic study starting as soon as at age 3. Solid academic attainment from ages 3 to 6 is generally viewed as an important preparation for primary school. The educational landscape is changing quickly. The 2010 Kenyan Constitution guarantees all children's right to free compulsory basic education, but the preschool sector is predominately dominated by the growing private school industry: an estimated 94% of preschool students in the study area of Mukuru are attending private preschools.

In May and June 2013 Innovations for Poverty Action conducted a data collection exercise in the Mukuru slum area of Nairobi. 221 household surveys, 29 headmaster surveys and 32 classroom observations were conducted with the aim of discovering the scale, cost and quality and preschool education in this area. This paper gives details of this research and its findings, a summary of which are included here:

- Over 80% of 4 and 5 year olds in the Mukuru area are attending preschools. These preschools tend to be fairly formal, and parents view them as educational establishments rather than daycare centers.
- These high attendance figures are achieved despite the fact that 41% of the 3-6 year-olds in the area live in households with a daily income of less than \$2.50 ppp per capita and 11% fall below 1.25\$ ppp per capita. As expected, however, preschool attendance is positively correlated with both household income and educational attainment of adults within the household.
- The overwhelming majority of caregivers view preschools as educational establishments; 79% of respondents said that their main motivation was that their child should learn skills or be educated. Only 8% said that they primarily sent children to school because there was no-one to look after them at home.
- It has been documented in Kenya that parents often view private primary schools as superior to public primary schools, and this seems to also hold true for preschools. On average parents estimate that attending a low cost private preschool instead of a public preschool would be associated with higher educational achievement and a 33% greater income at the age of 30. This further indicates that parents seem to value preschool as important both in terms of immediate school readiness and future career prospects.
- The average caregiver knows of 4.9 preschools that their child could walk to, which shows the large set of options that parents have when choosing a preschool. Amongst the major factors caregivers consider are proximity, teacher quality, fee level and school test results.
- We find strong evidence that parents perceive more expensive private schools as superior to low cost private schools. This, taken with the correlation between household income and preschool expenditures, and the importance of fee level in choosing a preschool, indicates that poverty may be a

significant barrier to some measures of quality preschool education. It is important to note that 'headline fees' only capture a portion of the total cost of sending a child to preschool; only a little over half (around 53%) of total preschool-related expenditure is on nominal fees. Other significant costs include uniform, food and books.

- The vast majority of private primary schools have attached preschools; only 3 of the 71 private primary schools that were attended by children in our household survey didn't have a preschool school attached. This does indicate that the "low cost private schools" movement, which is particularly developed in urban Kenya, is also reaching preprimary students.
- Children are taught literacy and numeracy, are given exams, and are ranked within the class from as soon as baby class (ages 3-4). Learning goals at young ages significantly outstrip those in place in Europe or America, and the teaching style of preschools mimics that of primary schools. This might be of concern to education experts, who emphasize the importance of developing a wide range of skills in preschool years, with equal emphasis being placed on social development, creativity, problem solving and emotional development.
- Forward-facing desks, a blackboard and exercise books seem to be standard across preschools, but beyond that infrastructure varies considerably. Schools are consistently better provided with learning material than with play material, which is in line with the strong academic emphasis of all preschools. Many preschools have little in the way of health or nutritional provision.

In general the preschool sector in Nairobi is large, vibrant and well-attended. Most parents are aware of the value of education at young ages, and a large majority of 3-6 year olds are attending academically oriented preschools. There is evidence suggesting, however, that cost remains a barrier preventing children from attending good quality preschools, and that preschools might benefit from improved facilities and a more diverse curriculum. The almost exclusive academic focus of many preschools is contrary to the recommendations of most literature on Early Childhood Development, and increasing the focus on holistic childhood development within the sector may be a necessary corrective.

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1. Sector Background: Early Education in Kenya

Nairobi has a vibrant private and public education sector. Kenya's education sector serves its more than 9.4 million primary school students, 1.7 million secondary school students and numerous, yet to be estimated preschool students reaching roughly 50% enrollment.¹ Primary education starts for children at age 6 turning 7 with Standard 1, and preschool serves children aged 3 – 6. Three levels of preschool are common: baby class (3 yrs turning 4), nursery (4 yrs turning 5), and pre-unit (5 yr turning 6). The preschool landscape is competitive and booming in Nairobi, and is widely viewed as an important preparation for primary school. Parents in Nairobi generally give a high priority to sending children to preschool if possible, and put a great deal of emphasis on academic study starting in baby class. Preschools abound in Nairobi and can be found on many streets and in many neighborhoods.

A major shift in the Kenya educational landscape occurred in 2003 when Government primary school fees were officially abolished. As a result of reduced government school fees class sizes increased as poorer families previously unable to send children to school enrolled them, and overall test scores dropped slightly as the student composition shifted. There are reports of a perceived drop in quality of government schools soon after and a related increase in demand for private schooling. As Boldy et al note "while actual fees in the government system fell to nearly zero under FPE [Free Primary Education], the price of private schooling more than doubled. [...] Meanwhile, demand for private school swelled, as seen in a trebling of private enrolment over the

same period that private school fees doubled."² Focus groups conducted in Kibera in 2008 recorded parents' perceptions of higher quality education in slum private schools in comparison to neighboring government schools, as well as concerns about the lack of commitment and accountability of teachers in government schools.³ Boldy et al further comment that while Free Primary Education increased access to education for previously excluded households, the drop in perceived quality of government primary schools and expenditure on public and private schools moving in opposite directions led to the rapid increase in demand and willingness to pay for private schooling in Kenya.⁴ This trend has maintained and the private school sector has continued to expand consistently over the past ten years.

Tracking educational achievement in this changing and increasingly divided context is complicated. The challenge of achieving quality education in Kenya has been highlighted in recent academic reports which show persistently low learning levels, though comparatively higher than other regional scores, as well as the continued growth of the largely unregulated private school sector. The 2010 Uwezo report shows disappointing levels of learning among primary school children.⁵ In Class 2 only 33% of children were able to read a paragraph at their grade level and a third could not read a word. However, results from the Southern and Eastern Africa Consortium for Monitoring

¹ Ministry of Education, Republic of Kenya, "A Policy Framework for Education: Aligning Education and Training to the Constitution of Kenya (2010) and Kenya Vision 2030 and beyond." Draft April 2013.

² Tessa Boldy, Mwangi Kimenyiz, Germano Mwabu and Justin Sandefur. "Free Primary Education in Kenya: Enrolment, Achievement and Accountability." August 2010.

³ James Tooley, Pauline Dixon and James Stanfield. "Impact of Free Primary Education in Kenya: A Case Study of Private Schools in Kibera." *Educational Management Administration Leadership* 2008; 36; 449.

⁴ Boldy et al, 2013.

⁵ UWESO, "Are Our Children Learning? Annual Learning Assessment Kenya 2010."

Educational Quality (SACMEQ) show Kenya faring well in the region with fewer non-zero scores compared to numerous countries, which some analysts have attributed to the highly competitive and academically focused preschool sector providing children with comparatively greater academic exposure before starting primary school.⁶

Free education access was expanded in 2010 when children’s right to free compulsory basic education (ECDE, primary and secondary) was guaranteed in the 2010 Kenyan Constitution. Recent legislation, yet to be fully enforced, requires all primary schools have a preschool attached⁷. In practice, however, the ECD sector is predominately dominated by the growing private school industry with significant differences between urban and rural access.

The Nairobi educational system was historically run by Nairobi Municipal Councils, a system distinct from the rest of the country. While the government has planned to integrate preschool into basic education and set up a regulatory framework, the preschool sector in Nairobi has been largely unregulated to date. The draft *Policy Framework for Education: Aligning Education and Training to the Constitution of Kenya* (2010) and *Kenya Vision 2030 and Beyond* state that ECD Net Enrollment Rates (NER) stood around 50 percent in 2010. Rough estimates suggest that while over 75% of urban students may be enrolled in preschool, closer to 25% of rural students are likely to be enrolled.

The perceptions about differences in educational quality between primary government and private

schools largely extend to the ECD sector as well, as showed in this report. The importance of the private sector is further enhanced by the wide supply gap between public and private ECD provision. Interestingly, as demand for preschool has grown fees have also increased significantly, and are at times higher than public secondary or university fees.

⁶ “What are the levels and trends in reading and mathematics achievement?,” SACMEQ Policy Issues Series. Number 2, September 2010.

⁷ Ministry of Education, Republic of Kenya, “A Policy Framework for Education: Aligning Education and Training to the Constitution of Kenya (2010) and Kenya Vision 2030 and beyond.” Draft April 2013.

2. Description of the study area: the slum of Mukuru



Nairobi is the largest city in East Africa, with a population of over 3 million,⁸ and includes a number of large slums.

The criteria for selecting the slum to be surveyed included a population over 150,000 (primarily to allow for a large enough number of preschools for our sample), and a relative accessibility. Mukuru met both of these criteria.

Mukuru is a large industrial community in the south east of Nairobi, bordering Nairobi International Airport. The community has grown in response to the expanding industrial area and job

opportunities at the many factories nearby. Four sublocations were included in the study in this broad industrial area: Mukuru Kwa Njenga, Viwandani, Imara Daima and Land Mawe. As of the 2009 census, these four sublocations (forming what we will call the greater Mukuru) had a population of 272,432.⁹ A map of the study area is presented below.

While a majority of this population, 247,301 people as of the 2009 census, lives in slum dwellings (i.e. mostly tin structures), the area also includes lower middle class communities living in multi-story

⁸ KNBS, Kenya National Bureau of Statistics, 2009 Population and Housing Census Highlights, 2010.

⁹ Calculations from the authors based on their own definition on the boundaries of those slum areas. Census data from KNBS census 2011.

buildings that were built in the last few years¹⁰. A few middle class gated communities and multistory apartment buildings have also recently developed.¹¹

The inclusion of those formal dwelling areas into the sampling frame was motivated by the fact that (i) it was interesting to allow for more variation in terms of poverty levels, specifically to be able to compare the choices of the poor with respect to those of the middle class regarding early education, and (ii) the only clear administrative boundaries were encompassing those areas. Those areas were only a very small proportion of the sample frame, and therefore including them did not reduce significantly the number of informal dwelling sampled.

Comparing Mukuru to other slums of Nairobi

Among the large number of slums in Nairobi, three are significantly larger than others: Mathare, Mukuru, and Kibera. As of the 2009 census, based on reasonable definitions by the authors of the boundaries of those slums, Mukuru had a population of 272,432, while Mathare was home to 284,849, and Kibera had 194,262 inhabitants.¹In terms of poverty levels, based on 2005/2006 data Mukuru ranks between Mathare and Kibera; poverty rates in Mukuru weres 29% in 2009, while 23% in Mathare and 42% in Kibera.¹²

Although reliable and recent information on educational services is not widely available, it seems that Mukuru lags behind other slums in Nairobi in this respect. Map Kibera, ia Kenyan NGO focused on gathering and sharing information about the services and realities in the slums, estimates that there are 260 schools in Kibera, but only 180 in Mukuru, despite the fact that the population of Mukuru is significantly larger .¹³

Anecdotal evidence also suggest that NGO activity in general is very limited in Mukuru, particularly in comparison to that of Kibera. In this regard however, it seems to be Kibera, and not Mukuru, that is exceptional; Kibera is by far the best-known slum in Nairobi, and therefore attracts a disproportionate amount of donor interest. This was also one of the reasons why Mukuru was believed to be a more typical and instructive community to learn from and study.

This and other differences emphasize the large variation between slums, which limits the ability to generalize the findings from Mukuru to the broader population.

¹⁰ Mostly in Kware, an area occupying on the western side of Mukuru Kwa Njenga, that used to be occupied by slum dwellings

¹¹ Especially in the southeastern part of Imara Daima, close to the main Mombasa road.

¹² Calculations from the authors based on their own definition on the boundaries of those slum areas. Population data from KNBS census 2011.Sublocation poverty rates based on World Bank, Kenya map database..Last accessed on August 2, 2009 on maps.worldbank.org/overlays/9833. The sublocation poverty estimates of this dataset were obtained based on data from the Kenya Integrated Household Budget Survey 2005-2006, using Principal Component Analysis and Small Area Estimation Methods.

¹³ I Furthermore, the data for Mukuru was gathered in 2012, while date from Kibera was gathered in 2010. This data was gathered by local community members trained by Map Kibera. Last accessed on August 21, 2013 at <http://mapkibera.org/mapmukuru/download/> and <http://mapkibera.org/download/>

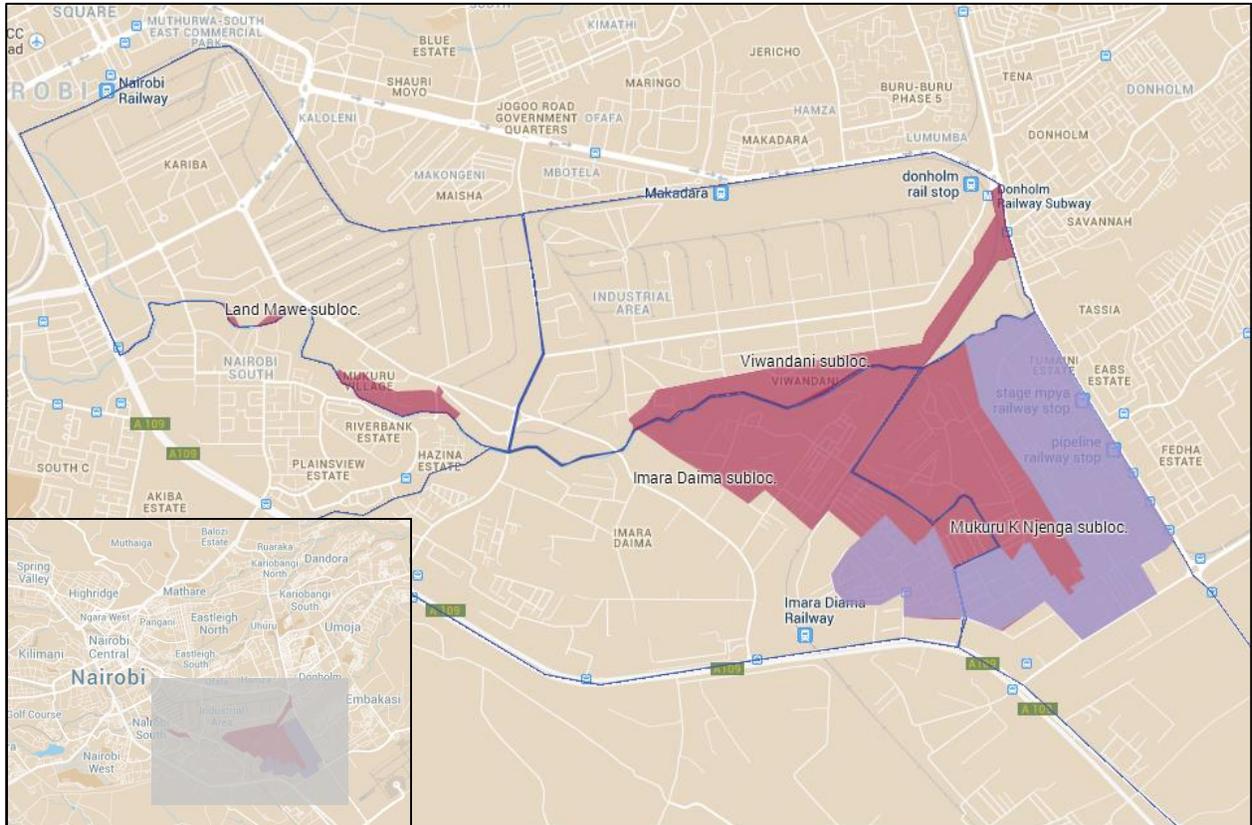


Figure 1: Map of the study area

in red: informal residential areas

in purple: formal residential areas

Other areas of the 4 sublocations outlined in blue were non-residential as of 2009, and therefore are not included in the sample frame.

3. Study design

3.1. Sampling design

Data was collected in Mukuru both through a household survey and through preschool headmaster interviews and classroom observations. We started with the household survey, for which a representative sample of the whole Mukuru area was randomly drawn. This household survey allowed us to build a list of preschools attended by a representative set of children (i.e. those that were in the households that were surveyed). Thirty preschools were sampled from that list to be visited.

As discussed in part 2, it should be emphasized that while both of those samples can be considered as representative of the whole Mukuru area, our findings cannot be generalized as such to other - and even seemingly similar - areas, and can only provide rough insights on what the situation is likely to be across Nairobi slums in general.

Sampling for the household survey

The sample was drawn to be representative of the greater Mukuru (i.e. the four sublocations). We used a 2-stage stratified cluster sampling, the clusters being enumeration areas (EAs) from the 2009 national census.

In a first stage, therefore, we worked with the Kenya National Bureau of Statistics to randomly sample 24 of the 994 EAs of the study area. Those EAs were defined by and used for the 2009 national census. Those are small geographical units precisely delineated so as to have about 100 households. Any geographical point of Mukuru (and of Kenya) belongs to one and only one EA, whether or not there was a structure there at the time of the census. This means that even structures that were built after 2009 are still

included in the sample frame, as they necessarily belong to one EA (only non-residential EAs as of 2009 were excluded).

The sampling of those 24 EAs was stratified by sublocation and slum/non-slum status as of 2009, so as to increase statistical power. Within each stratum, the EAs were sampled with a probability proportional to the size of the EA (measured in number of households as per the 2009 census), so as to be as close as possible to a self-weighted sample. Since the number of households in 2009 is different from the actual number of households we found in 2013, and since we used the structure and not households as the sampling unit (as described in the second stage below), non-equal sampling weights are still used in the analysis.

Maps of these 24 EAs from the 2009 census were provided by the Kenyan Statistical Service, including drawings of individual structures in each EA. These maps were then updated by the IPA team, noting the significant changes in structures and landmarks, through careful mapping of each structure in each location. This step was important to be sure that the sample frame included new, and excluded demolished, residential structures. One of the 24 EAs was then withdrawn because all structures in the area had been destroyed since 2009.

In each of the 23 remaining EAs, all residential structures were systematically assigned an ID number, after which we randomly sampled the number of structures that was estimated to be necessary to obtain 45 households (in each EA we determined the necessary number of structures by using the number of households per structure as of 2009).

We then considered all the households living in these structures. This led to a sample of about 1000 households to be located across EAs. Among them, only the households with at least one child aged between 3 and 12 were actually surveyed. This led to 234 eligible households, which were all visited. Successful interviews were conducted with 220 of these households (others were absent during all visits – at least twice, including on one week-end day- or refused to participate). Out of those 220, the 156 households that had at least one child aged between 3 and 6, or above 3 and attending preschool, were administered a full survey, while the 64 households that only had children aged 7 to 12 and not attending preschool were administered a short survey (see details in part 3.3. below).

Sampling for the headmaster survey and classroom observations

From this sample of 220 households 77 preschools were identified as being currently attended by children in the household. Note that we had intended to include in the sample frame any center welcoming more than 5 children aged 3-6, to include more informal providers, but no center was mentioned that fit these criteria and was not described by parents as being a “preschool”. Therefore, in the rest of the report, we will be using the concept of *preschool* and *ECD center for schooling for children aged 3-6* interchangeably.

Out of the 77 preschools, we excluded the 3 that we knew were not located in Nairobi (those children were presumably living in their household only part of the year). Out of the 74 remaining schools, we sampled 15 to receive the headmaster survey only, and 15 to receive both the headmaster survey and classroom observations. This sampling was done using a stratification by public/private status, nominal fees (terciles), whether the preschool was attached to a primary

school, and whether the preschool had (i) only been mentioned by parents only as being the best in terms of quality within a walking distance, (ii) only been mentioned as being the worst, or (iii) neither mentioned as one or the other, or mentioned by some parents as the best, and some as the worst.

We chose sampling weights in each stratum in a non-proportional way, so as to have enough observations in strata that we were particularly interested in. In particular, we decided to oversample slightly preschools that had been listed only as best, or only as worst, to be able to better understand what parents view as quality provision in the early education sector - a question which will be addressed in future reports.

Out of those selected, 3 of the 30 preschools had to be replaced by another randomly selected preschool within their stratum because they were then found to be outside of Nairobi or because the headmaster refused to participate. One other preschool headmaster refused to participate too late in the survey process to be replaced, resulting in a finally tally of 29 headmaster interviews.

In the 15 of these schools that were also selected to receive classroom observations, we conducted those observations in one class per grade (for example, in a preschool with 2 classes for each of 3 different grades, we observed one class randomly chosen per grade. In a preschool with 1 class of children aged 3-5 and one class of children aged 5-6, we observed both classes). One headmaster refused the classroom observations, so that we finally performed 32 classroom observations across 14 schools. This classroom observation data will be further analyzed in future reports.

3.2. Description of the data collection instruments

The Household Survey focuses on costs and priorities around children's education, as well as basic facts about the family, household finances and infrastructure. Specific questions were asked for each child aged 3-12 per household. The questions were largely close-ended with pre-tested and populated answer options. The definition of the household used was a group of people eating food purchased from the same budget, and recognizing the authority of one person, the head of household.

The questionnaire was administered to the head of household whenever possible and if not to the caregiver of the children under consideration. We allowed for other adults in the household to be interviewed if the household didn't have any child aged 3 to 6 or going to preschool, given that the shorter interview that was applicable to these households had more simple and objective questions only.

Questions related to the range of broader fees associated with attending schools and the schedule of the school were included, as well as more complex questions about the definition of quality for preschools, expected returns to investment in preschool, and priority ranking of level of education. The survey was electronic and done via PDA at the household, taking between 35-45 minutes for households with children aged 3-6 or going to preschool, while a shorter survey of about 10 minutes was administered to households that only had children aged 7-12 and not going to preschool (the main objective being to also build a representative sample of primary schools, in order to calculate the proportion of primary schools that had a preschool attached).

The headmaster survey, lasting about 45 minutes, aimed at gathering numerous details about the schools finances, class size and school infrastructure, teacher qualifications, curriculum and goals for students, as well as other challenges or distinctive characteristics about the school. The headmaster was the preferred respondent, though senior teachers were interviewed if the headmaster was not available or did not have sufficient information to answer the questions. A majority of the survey is close-ended questions with pre-tested and piloted answers, however a selection of broader questions regarding learning goals and challenges were asked as open-ended questions to allow for a full range of possible answers. The goal of the survey was to capture details on the key quality metrics outlined in a pre-determined analysis plan. A few observable infrastructure questions were to be recorded by the enumerator for each school as well.

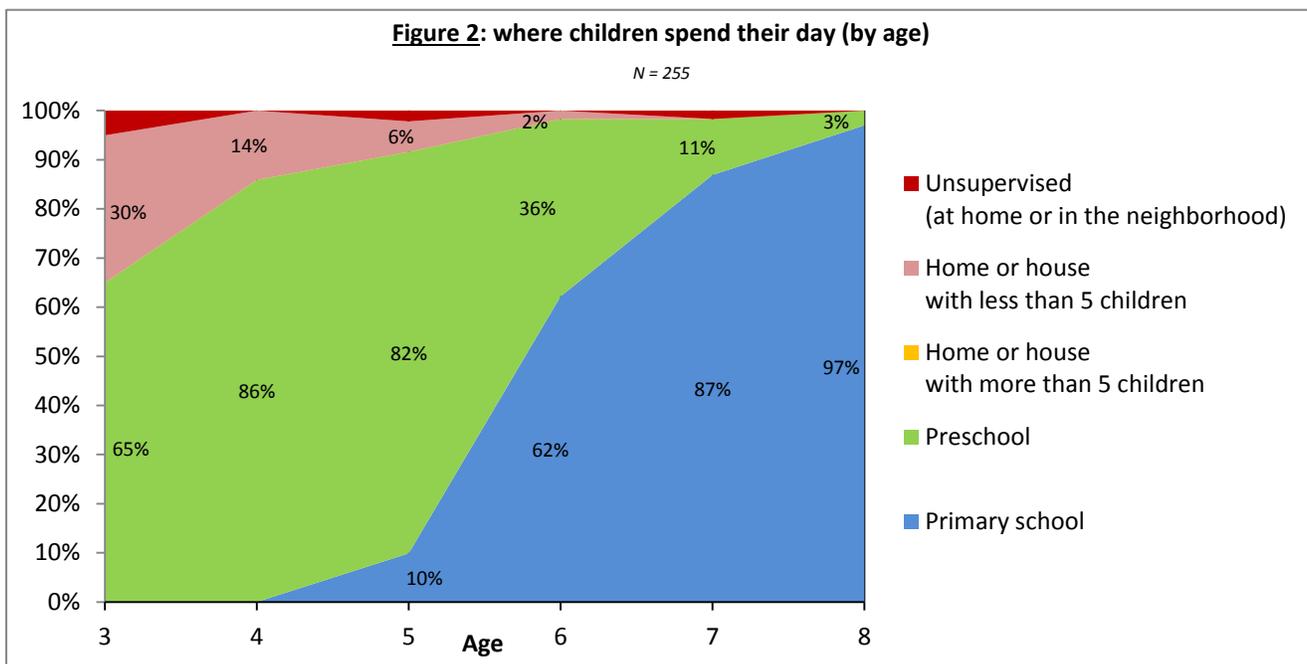
The classroom observations were conducted in half of the selected preschools. The instrument focuses on supplementing the headmaster interview and covering the remaining key indicators of quality. The 60 minute observation was conducted for the baby class, nursery and pre-unit classes in each of the selected schools. The instrument documents the activities of the broader class, the teacher's focus and current lesson, and the specific activities of three individual children over the 60 minute period, recording detailed information every 3 minutes. Additional data regarding classroom materials, infrastructure, class size, and teacher/student ratio were recorded as well. The enumerator recorded the information silently, not disturbing the class. Observations were conducted in the first half of the school day in an attempt to capture instructional lessons at similar times across schools.

4. Findings

It should be mentioned that with the limited sample size (220 households and 29 preschools), the confidence intervals on all our estimates are relatively large. The 95% confidence intervals are shown on all histograms below. Despite this strong caveat on the level of precision of all our estimates, we estimate that this sample size is sufficient for the purposes of this exploratory study.

4.1. Participation in ECD centers

4.1.1. General participation statistics

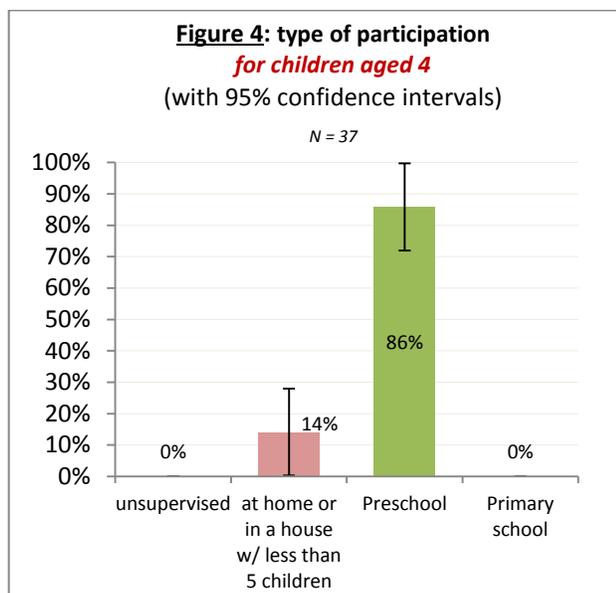
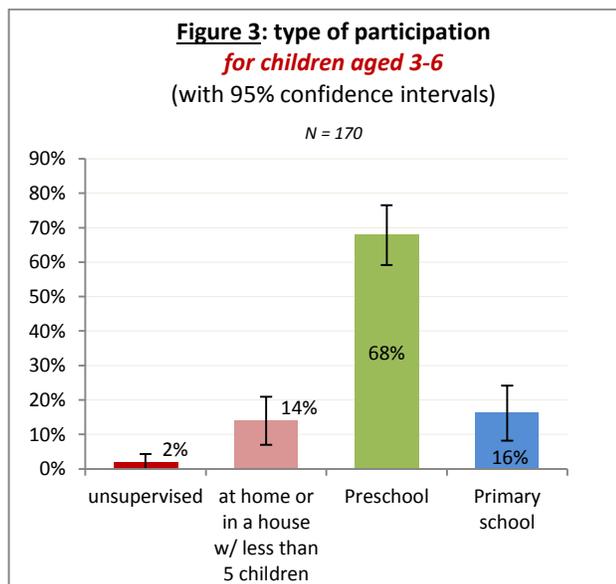


We first analyze where children generally spend the day. As shown on Figure 2, preschool participation rates are surprisingly large: **more than 80% for the 4 and the 5 years old in the greater Mukuru as a whole.**

As a side note, despite the mandated primary school starting age of 6 (turning age 7 in the school year) it's worth noting from Figure 2 that preschool (not primary) attendance rates for children aged 7 or 8 is not negligible (though the sample is not very large, e.g. the 11% of children aged 7 only correspond to 5 children in our sample). The main

reason mentioned by parents for sending these older children to preschool despite their age was that the child had started preschool late. This points to the fact that parents do think that preschool is part of the normal curriculum that a child should follow (see below for further discussions on parental views of preschool in Mukuru).

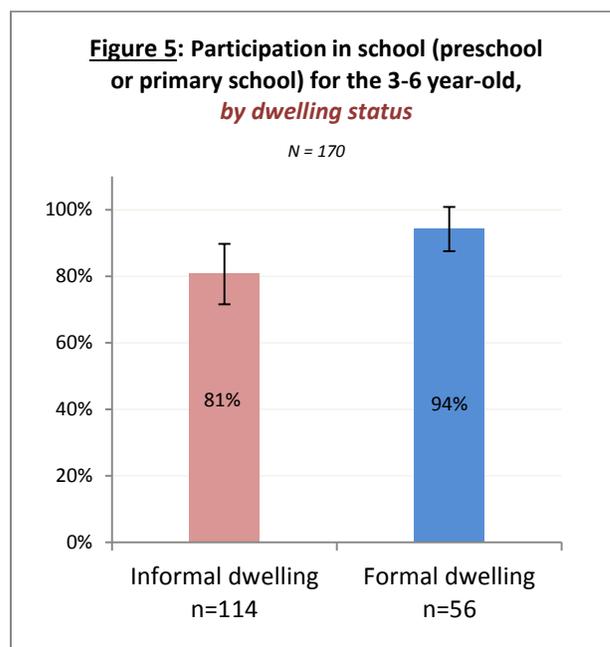
As illustrated in Figures 3 and 4 school or preschool participation rate for children aged 3-6 is 84% (+/- 7 percentage points), and the preschool attendance rate for children aged 4 is 86% (+/- 14 percentage points, 95% confidence intervals).



The preschool or primary attendance rate for girls aged 3-6 is 82.6%, while it is 85.2% for boys. However, this difference is not statistically significant, thus may not reflect a true gender gap.

4.1.2. Breakdown of participation by informal/ formal dwellings

The survey was conducted across the 4 sublocations of the greater Mukuru. Most of the dwellings in the area are informal (i.e. “slum” dwellings), but formal dwelling areas were also included so as to provide a comparison with the middle class. From our survey data, an estimated 75% of children aged 3-6 across the 4 sublocations of the Greater Mukuru live in an informal dwelling, generally a tin structure. As expected, the rate of school (preschool or primary school) participation for the 3 to 6 years old is lower in slum areas (the difference being statistically significant at the 5%-level). It is yet still quite high with participation estimated at 81% for informal dwellers.



4.1.3. Breakdown of participation by poverty status

In an attempt to get precise estimates of poverty and household financial status, often difficult numbers to calculate, we tested two data

collection methods to assess poverty status in the household survey:

➤ **Poverty status based on reported income:**

The respondent was asked to estimate income in a typical month along five dimensions (salaries/wages, profit from businesses, agricultural income, remittances, other income) for all household members in the household older than 12 years. We add those individual incomes, and derive daily income per capita in the household.

This data provides interesting ballpark figures, but it should be noted that it is available for only 77% of the households with children aged 3 to 6 – most often because respondents refused to provide the estimated income for at least one member of the household (and in a few cases, because the household total income was inaccurate and too low given reported school expenses).

Based on this imperfect data, we find that 27% of the 3-6 year old children in the area live in extreme poverty, i.e. in a household earning less than \$1.25 PPP per capita per day, and 66% live in a household earning less than \$2.50 PPP per capita per day. Those figures increase to 26% and 53% respectively among the sample of informal dwellings only.¹⁴

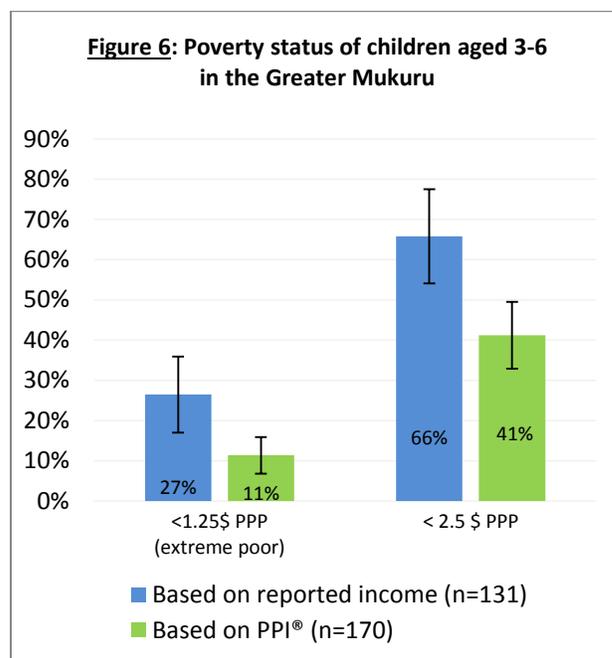
➤ **Poverty status based on the *Progress out of Poverty Index*® (PPI):**

This tool, developed by Mark Schreiner from Microfinance Risk Management L.L.C, is comprised of a country-specific set of 10 simple questions, mostly regarding the ownership of certain assets. It

¹⁴ PPP is in 2005 international USD. Conversion rate used: 1 international USD 2005 = 52.36 Ksh of 2012 (authors’ derivation based on data.worldbank.org/indicator/NY.GDP.MKTP.CN and data.worldbank.org/indicator/NY.GDP.MKTP.PP.KD)

produces a score (the PPI index), that estimates the probability that the household is below a certain poverty line.¹⁵ Those questions being less sensitive than income question, we had a response rate of 100%.

Based on this data, our estimates of poverty are slightly lower: we estimate that 11% of the 3-6 year-olds in the area live below the \$1.25 level, and 41% below the 2.50\$ level. Those figures are 14% and 47% respectively when restricting the sample to informal dwellings only.

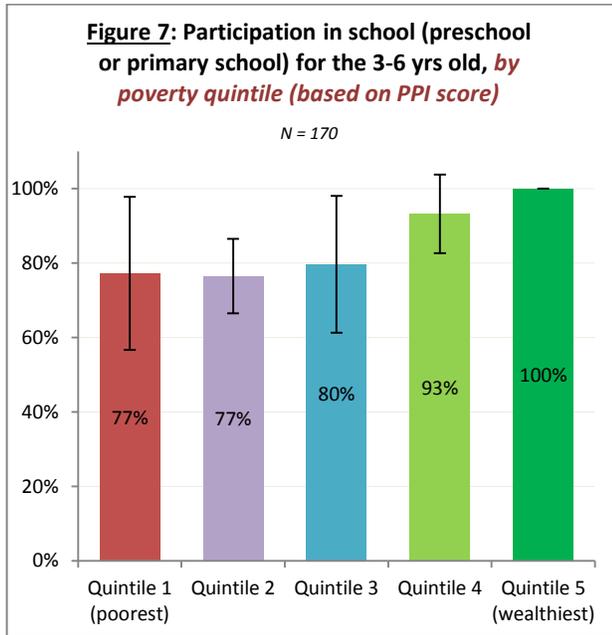


The correlation between PPI score and income per capita in our sample is fairly high (48%). Moving forward in this report, we will use the PPI index as our preferred poverty measure, since it removes the problem of missing data and is likely less prone to under-reporting.

Using the statistics on poverty status, we now look at school participation for children aged 3 to 6

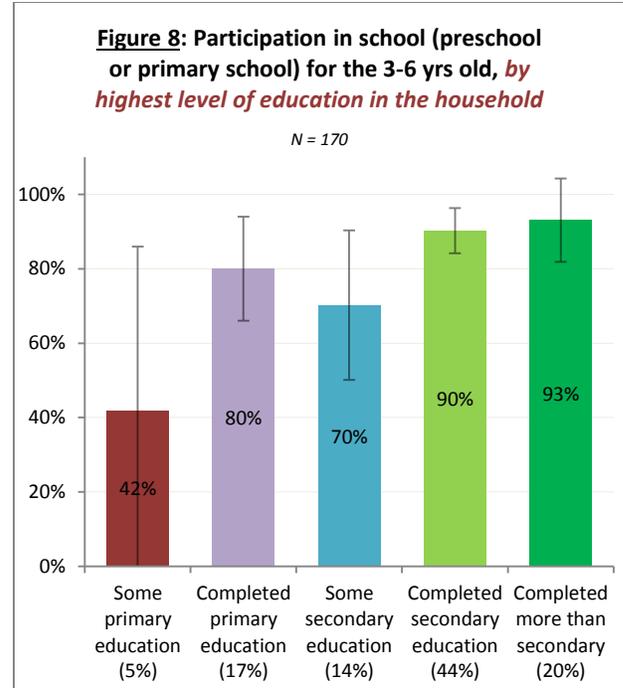
¹⁵ “Progress out of Poverty Index: A Simple Poverty Scorecard for Kenya”, Mark Schreiner, 2011.

using PPI score quintiles (see Figure 7). Generally, we see wealthier households do send their children aged 3 to 6 to preschool or to primary school more often. The participation rate in fact statistically significantly associated with PPI score (whether we use a probit or a logit regression model). However, strikingly still about 3 out of 4 children from the poorest quintile do go to school .



4.1.4. Breakdown of participation by level of education of parents

In the survey area, we estimate that 95% of the children aged 3 to 6 have at least one member in their household who completed primary school, and no less than 65% have at least one member in their household who completed secondary school. The breakdown below (Figure 8) shows that a higher education level in the household is associated with larger participation rates. This association is statistically significant (which we see whether we use an ordered probit or an ordered logit model).



4.1.5. Absenteeism and time spent in preschool

According to the household survey data, among all children who go to preschool, the very large majority (~97%) attended at least 4 days in the last school week before the interview happened. We also asked the headmasters to assess the proportion of enrolled children that were absent in an average day. The average was 19%, showing significant but not overwhelming absenteeism given the age range.

Many hours are spent in preschool for children in the sample. Among preschool students, the median amount of time spent in preschool in a typical week is in the 35-45 hour range. 99% of preschool students are spending more than 15 hours at school in a typical week, and 90% more than 25 hours.

4.2. Description of the demand for ECD services

We asked caregivers of preschool students to name the preschool they thought was of best quality among those that they knew of within walking distance for their child: we found that a majority, about 65% of preschool students who are walking to preschool, are attending a different preschool than the one their caregivers think is the best quality within walking distance. This number goes up to 88% for the poorest quintile (based on PPI index), while it is only 44% for the wealthiest quintile.

Unless good preschools are overcrowded (which will be shown to be unlikely by an analysis done in part 4.3.), this seems to indicate that there is probably a demand-side barrier preventing parents from choosing the best quality ECD, in particular for the poorest households. In this section, we will aim to clarify if parents do not value preschool education highly enough to switch schools, or whether it is due to their ability to pay.

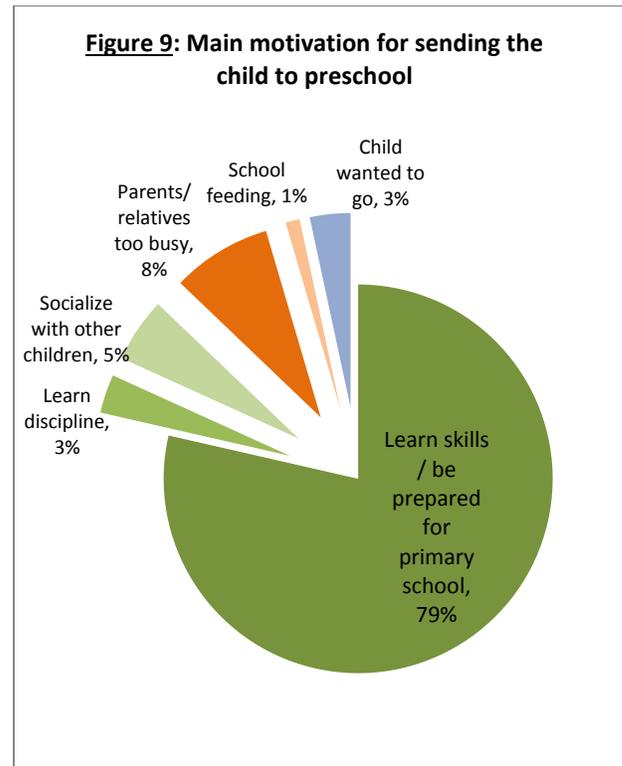
4.2.1. Parents value preschool education highly

Estimating the demand function for preschools cannot be done in a satisfactory way with an observational study (i.e. without imposing an exogenous variation on prices). However, one can (i) try to understand the nature of the demand for preschool services to get a sense of whether willingness to pay is likely to be high, and (ii) estimate the expected returns to preschool education for parents.

- **Nature of the demand for preschool services**

To approach this question, caregivers of preschool students were asked an open-ended question about the main reason why they were sending their child to preschool. Their responses were

categorized by the enumerators, and the results are shown on Figure 9.



Only 8 percent view preschool primarily as a daycare service. A very large majority of responses were that the main motivation was for child to learn skills or be prepared for primary school. Despite the open-ended format of the question, one cannot completely rule out the possibility that some parents may have tried to answer what they thought the surveyor was expecting. That being said, it is interesting to note that among those 79 percent, at least three respondents explicitly mentioned that sending a child to preschool before primary school was simply the way the system was in Kenya.

If one looks at the reasons stated by parents who don't send their preschool-aged children to

preschool as to why they make this choice, it is clear that even among them preschool doesn't seem to be viewed simply as a daycare service: out the 26 children aged 3-6 not going to school, only for one mentioned the main reason for not sending the child was that there was someone at home to take care of them. The main reason mentioned for others not sending the 3 to 6 year-old child to school is budget-related (main reason for 51% of applicable respondents).

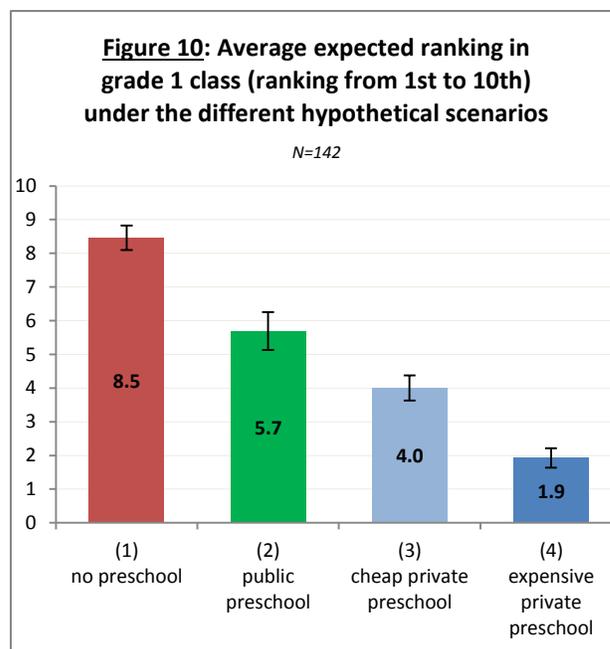
Overall, there is therefore a clear education-related motivation, which points toward a likely strong demand for teaching-oriented preschool services (as opposed to simple daycare services).

- **Expected returns to preschool education**

To get at the subjective concept of expected returns to different types of preschool, and thus the rank in terms of quality and expected skills gained, we asked respondents to estimate long term returns for each child aged 3 to 6 or going to preschool. We first asked caregivers to assess how their child would rank in grade 1 under four distinct hypothetical scenarios:

1. the child didn't go to preschool before grade 1
2. the child went to a public preschool
3. the child went to a cheap private preschool, costing below 300 KSH/month (3.64 USD)
4. the child went to an expensive private preschool, costing above 500 KSH/month (6.07 USD)

In each of the scenarios, the respondent was invited to rank the child between 1st and 10th (1st being the best student in the class, and 10th the weakest). Figure 10 shows the average ranking in each of the four scenarios. Those figures clearly point towards the fact that caregivers do understand preschool as an important preparation to succeed in primary school.



We then used the same four scenarios and asked parents how they thought their child would earn per month when they are 30 years-old. Figure 11 shows the average expected monthly salary¹⁶ under scenarios (2), (3), and (4) compared to the no preschool scenario. Note that this data indicates very optimistic expectations knowing that average reported income in the 25-60 year old population is 91.37 USD per month in our sample.^{17,18} We can see the very large difference in expectations between the no preschool scenario and the preschool scenarios.

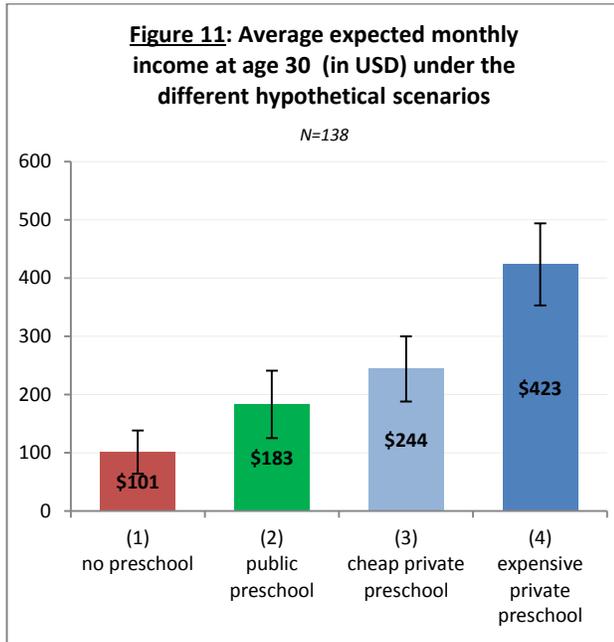
One cannot be sure that some of those responses are not driven by what the respondent thinks we are expecting to hear. That being said, the very high preschool participation rates described above

¹⁶ We asked for income ranges only instead of actual figures. Therefore, to calculate those averages, we assigned to each range its middle value. For the last range –namely “50,000 KSH per month or more”, we assumed that the average would be 60,000 KSH.

¹⁷ This income data is available only for households that have kids aged 3 to 6 or going to preschool –which are the same households for which the question about expected returns to education. That being said, as described in part 4.1.3, note that it is possible that this income data suffers from some degree of under-reporting.

¹⁸ Exchange rate used: 1 USD = 82.356 KSH

do reveal preferences that are in line with those subjective expectations.



Therefore, those results seem to indicate that parents do value preschool as an important step for the future life of a child, both in terms of immediate school readiness, career prospects and income in the future.

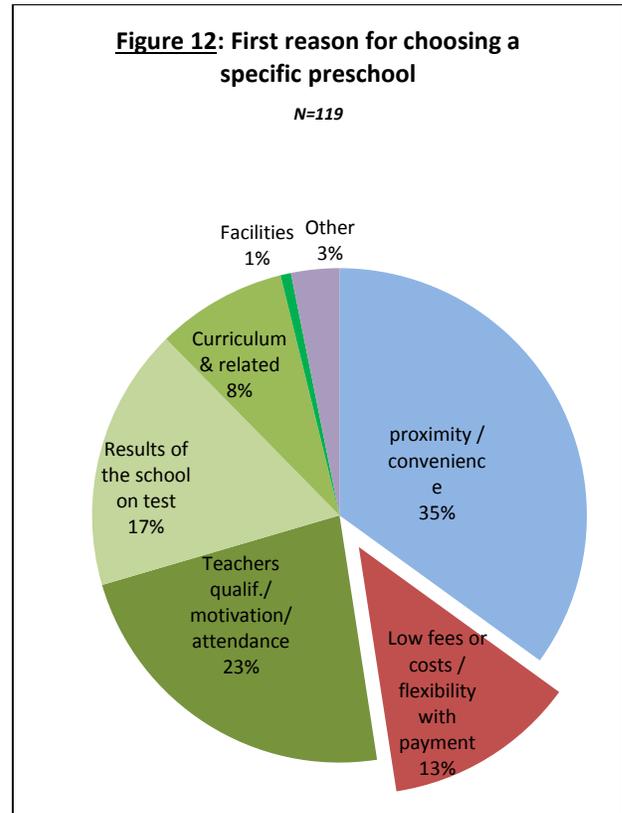
Beyond the fact that those expected returns seem to be very high, it is interesting to note that respondents seemed much more confident in the returns of even a cheap private preschool than at a public preschool. Anecdotal evidence gathered when piloting this survey, which supports previous research, suggests that parents believe public schools have higher class sizes and less motivated teachers.

These large and significant differences confirm that **the largely documented parental perception that public primary schools are of lower quality is also true for the preschool level.**

Last and interestingly we find no significant difference in expected income for girls versus boys in any scenario.

4.2.2 Low ability to pay

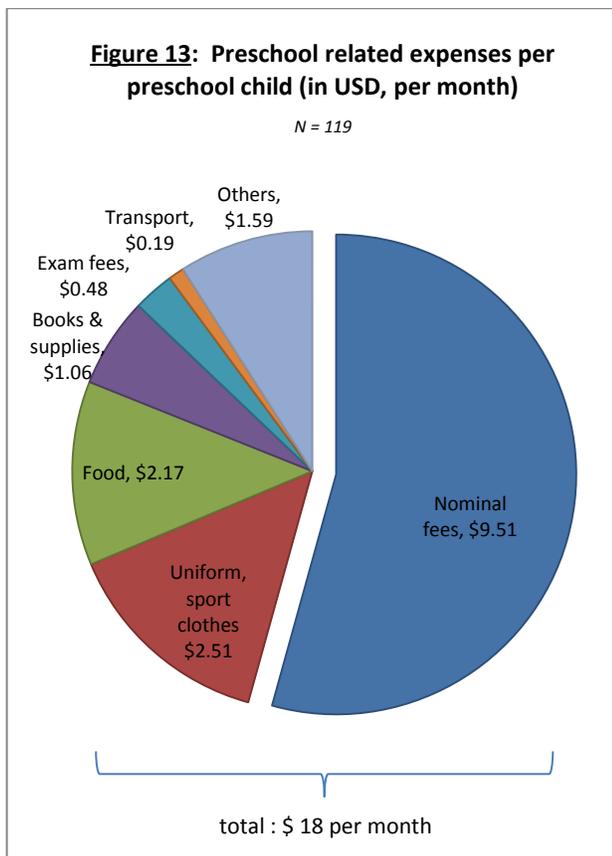
With clarity that parents place significant value on a preschool education, we investigate whether cost might be a barrier preventing them from choosing the best preschool. We first look at the reasons for choosing a specific center.



The reason mentioned most often was related to convenience and proximity, but cost (or flexibility with the schedule of payment) was mentioned by 13% of the caregivers of preschool students as the main reason for choosing a specific preschool. 9% mentioned cost as the second most important reason, which means that cost is a strong consideration when choosing a preschool for at least 22% of the children. Conversely and perhaps more interestingly, cost is not a major factor for over 3/4th of the children despite the financial realities of the sample.

To further investigate this aspect, we look at preschool related expenditures. In Figure 13, we

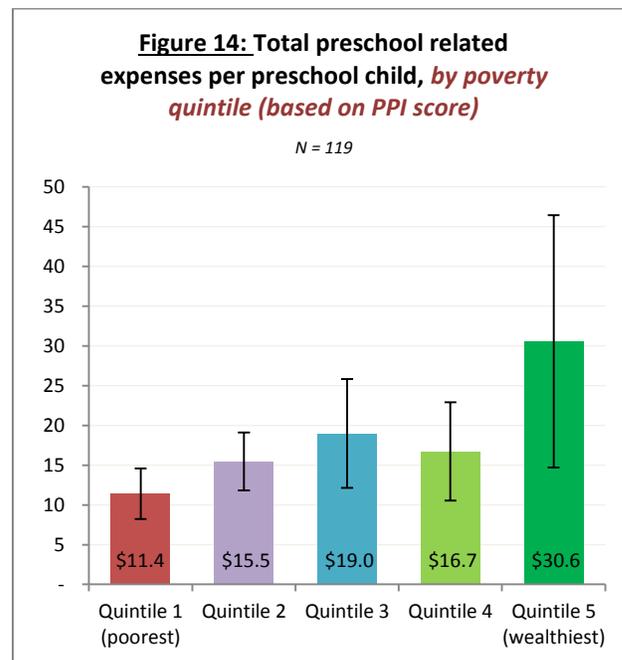
show the various preschool related expenditures. By preschool related expenditures, we mean the expenses that would not have been incurred if the child was not going to preschool. Some are fees charged directly by the school (nominal fees, exam fees, school feeding fees), others are expenses that are not paid to the school but would not have been incurred (e.g. uniform, books) if the child was not going to preschool. The sum of all those different costs is the total monetary cost of sending the child to preschool, which is about \$18 dollar per month per child on average.



Based on the self-reported income data described earlier, this would represent as much as 12% of the household total income on average. While this figure should be treated with caution given the potential underreporting on household income, it is still safe to say that parents do allocate a very substantial proportion of their income on preschool related expenses. This indicates again

that caregivers do see preprimary education as an important investment. However, if we look at this fact from a different angle, this also means that preschool services are in fact expensive for this population compared to other services, especially when considering educational costs of multiple children.

We then look at the variation of preschool expenses across the different poverty quintiles (again, based on PPI®). The results are presented in Figure 14.



As expected, preschool expenses of poorest households tend to be lower. This association is statistically significant (using a binary regression of total preschool related expenses on PPI score). In other words, preschool students from poor households have significantly less preschool related expenditures. This is also true if one looks at nominal fee expenses only. Since reductions in fees or scholarships are only anecdotal, this seems to re-enforce the conclusion that **preschool choice is certainly affected by poverty level, or in other words, that ability to pay seems to act as a significant constraint when choosing a preschool.**

4.3. Description of the supply of preschool services

This section of the analysis draws on the headmaster survey data more intensely than previous parts. Therefore, we first provide some elucidation of the data to assist the reader in putting in perspective the quantitative claims we're making below.

The relatively small sample size produces large confidence intervals. Even more in this survey, the figures provided below only provide indications of actual figures across Mukuru, but cannot be considered precise.

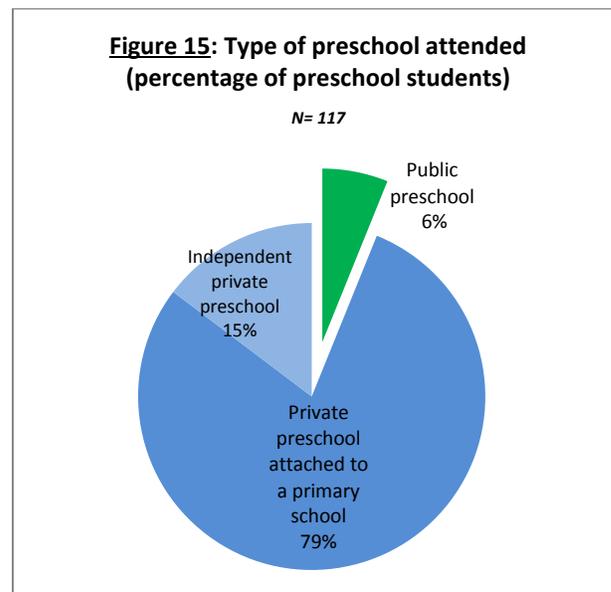
Second, we will make two different types of claim, using two different sampling weights systems. Sometimes we will say "x% of preschool students attend a preschool that have/do...", in which case we're putting larger weights on preschools that were attended by multiple children in the sample. In other instances we will say "x% of the preschool attended by our sample of children have/do...", in which case all 77 schools that were in the preschool sampling frame are given equal weight. We are using the weight system that seems most relevant in each instance.

Third, due to the nature of the data we will draw more heavily on qualitative than quantitative analysis. Quantitative supporting data will not always be available or appropriate.

4.3.1. Typology of preschools in Mukuru

- **The quasi-exclusivity of the private sector**

No less than an estimated 94% of preschool students in Mukuru go to a private preschool (Figure 15). In absolute numbers, out of the 77 preschools attended by children from the sample, 71 are private.



Recent – and yet not fully enforced- legislation requires that all public primary schools in Kenya have a preschool attached. Against this legislative background the scarcity of the public preschool provision in Mukuru is striking. Out of the 77 preschools attended by children from the sample, only 6 were public, among which only 2 are located in the Mukuru area, whereas almost all of the 71 private preschools attended by children in the sample are inside Mukuru.¹⁹

Our data indicates that this finding is not solely applicable to preprimary education; only 21% of primary school students from Mukuru are attending a public school.

These figures reinforce the evidence for the trends noted above – that of greater demand for private education and continually growing supply of private educational services in Nairobi. While the government is publically committed to free access to preschool there is more to be done to reach this

¹⁹ Exact information on the exact number of private preschools was not gathered as part of this survey.

target, with a gap reportedly far greater in rural areas in Kenya.

- **Minimum Government criteria for registration can be difficult for slum schools to fulfill**

According to the official policy of the Ministry of Education “All institutions offering early childhood services (ECDE, ECD, ECDC²⁰, children’s homes, day care centres, etc) must be duly registered with the relevant Government authorities.” Full registration costs 5000 Kenyan Shillings (approximately 60 USD), and centers must fulfill a variety of criteria. A subset of these is listed below²¹:

1. In urban areas an ECDE centre compound should be at least 0.125 acres (though it may be smaller in urban slums if centres meet basic conditions of sanitation and health).
2. The standard size of an ECD classroom shall be 8 x 6 metres to accommodate a maximum of 25 children.
3. Classrooms shall be accessible for use by children with special needs.
4. An ECD centre shall have toilets/latrine for boys, girls and teachers [Minimum toilet-child ratio =1: 25).
5. ECD centre/institution shall provide safe drinking water.
6. The play and learning equipment shall be age and developmentally appropriate.
7. Outdoor play area must be large enough for the number of children in the centre to play and run around safely.

8. ECDE centres shall provide children with a snack and if children are there for a full day lunch should also be provided.
9. The ECD centre should be fenced and have a lockable gate.
10. The teacher child ratio should be no less than 1:15 for 3-4 year olds and 1:30 for 5-6 year olds.
11. Teachers should possess at least a certificate in ECD offered by a government-authorised institution, and should be registered by the Teachers Service Commission.
12. The Headteacher of the school should have, at minimum, academic qualification of KCSE D+ or its equivalent.

After schools have submitted their registration forms they should be visited by officials from the Ministry of Education to ensure that they meet all of the above criteria. Re-registration is required if schools add new grades, move site, change curriculum or come under new management.

Based on our observations a large proportion of the schools we visited in Mukuru would be unable to fulfill all of these criteria. Only 65% of the preschools attended by children from our sample have fenced compounds, only 66% have any sort of outdoor play area and less than 50% meet the latrine number requirement, and less than a third meet those three requirements alone.

Yet, about 70% of the preschools attended by the children in our sample are described by the headmaster as being registered with the government. Almost all the others (28%) were described as having started the process. While self-reported data like this on such a sensitive topic should be treated with real caution, this would tend to indicate that the rules around registration may not be consistently enforced.

²⁰ Early Childhood Development Education (ECDE), Early Childhood Development (ECD), Early Childhood Development Center (ECDC)

²¹For a full list of registration requirements, and other information on Government policy as relates to ECD, please see Government ECD Education Service Standard Guidelines , last accessed on 21st August 2013, which can be found at

<http://www.education.go.ke/Documents.aspx?docID=1531>

- **Most private preschools are standalone schools, but chains of schools are increasingly a feature of the educational landscape**

Most of the private schools in Mukuru are a single standalone school owned by an individual. 18% of the schools attended by our sample of children, i.e. 5 schools, were part of a chain, with 3 separate chains being represented in total. Of these 5 schools 4 had been founded in the last 5 years, and the largest chain in the area, to which 3 schools in our sample belonged, has announced its intention to open more schools in and around the slums of Nairobi.

- **Most preschools are attached to low cost primary schools**

Figure 15 shows that an estimated 79% of Mukuru preschoolers are attending a private preschool that has a primary school attached to it. In absolute numbers, 63 of the 71 private preschools that we listed are attached to a primary school. Data on school fees described in part 4.3.2 shows that these are mostly low cost private schools (LCPS).

Among the 79% of primary school students attending private schools, 98.6% were attending a school that had a preschool attached. In absolute numbers, only 3 of the 81 private primary schools that were attended by children in the sample didn't have a preschool school attached. This is confirmed by the headmaster survey data, where only 1 of the 29 preschools didn't have any primary school level (though interestingly, an estimated 29% of the preschools attended by our sample of kids were not offering all primary school levels yet: qualitative discussions with headmasters have noted that private schools typically open one additional level each year, generally starting with preschool levels. We would expect to see, therefore, that newly opened preschools might open a Standard 1 when their first cohort would otherwise have graduated out of the preschool and

then a Standard 2 in the following year). Anecdotally from parents and school administrators we learned that parents often prefer to their children to attend the same school for easier logistics and allowing older siblings to help younger siblings travel to and from school, thus making multi-grade schools preferable when available.

Overall, this does indicate that the “low cost private schools” movement, which is particularly developed in urban Kenya, is also reaching preprimary students. In Mukuru, indeed, we have found that private primary schools and private preschools are virtually the same sets of schools.

4.3.2. Quantity considerations

We already know, from looking at preschool participation rates in part 4.1., that supply is meeting demand to a large extent. This does not necessarily mean that the market is saturated, as parents might not have a wealth of options in the immediate vicinity where they live – which would mean that they wouldn't necessarily have a good quality preschool near their home.

To look at this question, we asked caregivers of children aged 3 to 6 or going to preschool how many preschools they knew in the area that their children could walk to (including the one that their child might be attending, if relevant). On average they know as many as 4.9 preschools within walkable distance, and 90% know at least 2 preschools within walking distance. And indeed, when working and walking in the slum of Mukuru, preschools seem to be amongst the most common non-residential structures in most neighborhoods. This does not mean that parents necessarily have a good quality option near where they live, but this does mean that parents of preschool children have, and know that they have, a surprisingly large number of preschool options to choose from.

In terms of means of transportation, it turns out that 97% of children are going to preschool on foot (either on their own or with their parents). On average, preschool students take 14 minutes to get to school.

We asked headmasters as well whether their preschools accepted all students, to verify whether preschools were saturated. An estimated 73% of preschools attended by children in our sample claim that they did accept all children, which seems to indicate that only about a fourth of preschools are saturated (and even less in case there are cases in which other criteria than saturation are being used to determine whether or not pupils should be accepted). This number was almost the same when we restricted the calculation to schools that parents listed only as the best school within walking distance: 71% of these ‘best preschools’ claim that they accept all students, the difference with other preschools is not statistically significant. **Therefore, we find no evidence that the preschools that parents consider of best quality are particularly saturated.**

It is interesting to further note that even a situation in which demand for preschool was equal to supply of quality spots would not necessarily mean that the market was saturated; a number of headmasters noted that many parents believe that newly opened schools are the best, and will move their children to these new schools even if they were not previously dissatisfied with the performance of the previous schools.

4.3.3. Quality considerations

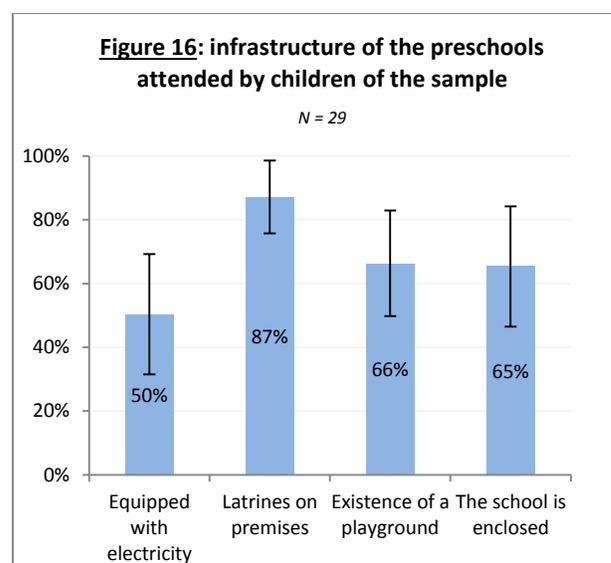
- **Infrastructure, equipment and materials**

Of the preschool classrooms observed there was decent infrastructure with basic learning materials, seating options, and teacher supervision in most settings. There was no shortage of basic learning

materials with an average of 100 exercise books per class (generally blank notebooks). However, other materials with additional content such as text books, storybooks or activity books were generally limited or absent.

The average preschool student in Mukuru is in a class of 27 students, with a student teacher ratio of 32:1 (26:1 when restricted to private preschools). These are above the government mandated ratios, and broader international standards recommend class sizes of 20 and student teacher ratios of 10:1, though these class sizes are still small in comparison to the primary grades.

The quality of infrastructures varies a lot: an estimated 50% the preschools attended by the children in our sample have access to electricity, 87% have latrines on their premises, 66% have a playground or an open space, and 65% are enclosed by a fence or a wall.



Classroom observations revealed there was an average of 3.7 students per bench desk, but very few, only 2 out of 32 class rooms observed, cases where the students were seen to have insufficient seating space. Less than 5 students on average per class were without a uniform, which is striking given the low income population surveyed. In

terms of materials, according to headmasters all schools had exercise books (on average 3.6 per child, this school level average ranging from 1 to 7). Only one preschool did not have textbooks, the average being 0.4 per student.

Given the highly competitive nature and close proximity of the private preschool sector, maintenance of the classrooms and observable infrastructure may contribute to maintaining a full roster and a strong reputation in the community.

- **Profile of teachers**

An overwhelming majority of preschool teachers are female: they are an estimated 95% of teachers in the preschools attended by children in our sample.

By their headmasters account, most of them have an ECD relevant training: 76% are said to have completed an ECD or preschool course or certificate, and 13% were said to be currently enrolled in such a course at the time of the survey.

31% were said to have received some type of in-service training. Such in-service trainings were delivered by various types of organizations, most of them from the school chain some of the preschools were part of, from the Aga Khan Foundation's EMACK project.

Teachers have on average 5 years of teaching experience, though only 50% of them have more than 3 years of experience.

- **A very academically oriented teaching style**

Our data suggest the sector is dominated by competitive and academically oriented private preschools. A competitive chain of private schools in Nairobi noted parents' focus on academic instruction and testing, and strong disinterest in class time spent on play, creative activities or other non-academic lessons. Many schools begin testing

children on academic skills with the three year olds in baby class, and continue testing children regularly through pre-unit. Some schools share tests scores with parents regularly or post them publically. Sector experts noted that parents use children's test scores to assess the quality of the private school and may change schools if children are not performing and the lessons and material are not advancing as rapidly as expected. This in turn puts significant pressure on the school administration and teachers to provide a rigorous curriculum and schedule.

The quality of instruction require further analysis, though initial review suggests significant gaps in quality with a hyper and nearly exclusive focus on teacher led academic instruction in all preschool grades (see the appendix for pictures of preschool classroom settings). Notably the classroom observations revealed 100% of the instruction was teacher led, where the teacher provided instruction at the front of the class to students at desks. The preschool classrooms almost entirely mimic primary school style of instruction and activity, though with smaller class sizes. Education experts emphasize the importance of developing a wide range of skills in preschool years, with equal emphasis on social development, creativity, problem solving and emotional development. Diverse classroom activities are recommended, both structured and unstructured, involving various types of communication, interaction and negotiation. Student directed and led activities are recommended as part of everyday, allowing children to develop a broader range of skills not addressed in teacher led and formally structured activities. These non-teacher led activities are important to engage all parts of student's brains and using broader verbal skills debating and discussing with one another and reinforcing math concepts with physical use and manipulation. Several studies have demonstrated that through play children learn to use more complex language

and mathematical concepts including spatial operations.

The academic focus and intensity of instruction starting at early ages in Nairobi is underlined by the aggressive learning goals for the preschool classes, significantly outpacing western academic learning goals for the same age groups and with far less focus on non-academic benchmarks.

The most common learning goals per grade level repeated across schools are noted here, which exclude the even more challenging outlier goals:

Baby Class (age 3)	Nursery Class (age 4)	Pre-Unit (age 5)
Know letter sounds a-z	Read 2-3 letter words	Read/write short sentences
Read and write 1-10	Read and write to between 20-50	Simple math operations (addition, subtraction)

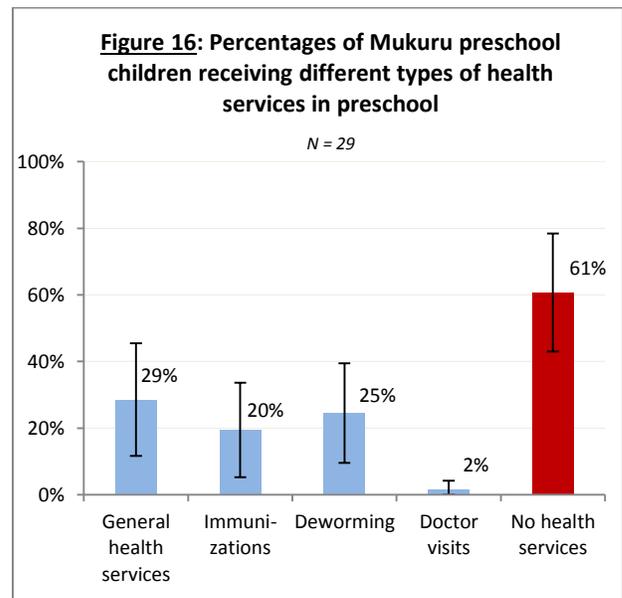
Many benchmarks in the US, for example, include more basic academic goals such as recognizing letters in one’s own name, creating rough representations of letters, beginning to pair letters with sounds, and identifying ten letters in the alphabet. These are often paired with equal focus on emotional, behavioral and physical goals, such as showing direction and motivation, being able to follow through with tasks, following multi-part instructions, calming oneself when upset, sharing, developing both gross and fine motor skills and developing a sense of self. However, in the US as well parents tend to put a great deal of pressure on children and also over-emphasize academic benchmarks. In his book academic David Elkind notes “It’s a parent issue, not a child issue...There’s a lot of peer pressure among parents. Parents feel they’re depriving their children unless they are

putting them in a high-pressure environment.” The almost exclusive academic focus on preschools in Nairobi is at the detriment of other key developmental activities experts recommend for these early ages and leaves great room for innovation and improvement.

- **Health and nutrition**

Despite the long hours spent in preschool (the median duration spent in preschool is between 35 and 45 hours per week), we estimate that 45% of preschool students attend a preschool that has no school feeding at all (whether or not it is provided for free), and 21% attend a preschool that has additional fees for meals.

There is also a large potential for improvement in terms of health services, since 61% of preschool students attend a preschool with no health services of any kind (Figure 16).



Appendix

Pictures of slum preschool classroom settings in Nairobi:

