Scaling Up Early Childhood Development and Education in a Devolved Setting: Policy Making, Resource Allocations, and Impact of the Tayari School Readiness Program in Kenya

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Abstract

Early childhood development and education (ECDE) is devolved in Kenya, which means that each of Kenya's 47 counties budgets for and implements ECDE independently. Kenya provides two years of preprimary education to children ages four and five. Given scarce resources, constructing facilities and hiring teachers are often principal considerations for county governments. The present study investigated whether and how counties go beyond the basic provision of facilities and teachers to invest in learning materials, expand teacher professional development, and hire coaches to improve the quality of teaching. These results are presented in the context of the Tayari ECDE program, which was designed to improve school readiness in a cost-effective way. We present qualitative findings from several counties to describe how government bodies invest in additional elements of preprimary quality improvement. We also compare results across counties that do and do not implement the Tayari model to understand whether implementation of an effective program to increase ECDE quality encourages adjustments in government resource allocations. In addition, we present quantitative results from a large-scale longitudinal treatment and control study of the Tayari model, which tested the effectiveness of curriculum-aligned instructional materials and teacher training and support in improving learners' school readiness in public and low-cost private learning centers. Finally, we present policy implications for decentralized government structures responsible for providing ECDE, noting how these can be supported and incentivized to increase investments in ECDE quality.

Keywords

International and comparative education, early childhood, early childhood education, early childhood development and education, education policy, education decentralization, education governance

Introduction

Evidence of the crucial contribution of high-quality early childhood development and education (ECDE) to brain development, future academic success, health outcomes, and overall national economic growth has been well established (Black et al., 2017; Duncan et al., 2007; Engle et al., 2011). Education policy makers in developing countries, who in recent years have been focusing on the rapid growth of the education system at the primary level, are becoming interested in advancing similar gains in the ECDE subsector. These policy makers' demands for increased ECDE provision have occurred in tandem with recent international commitments toward expanded and improved ECDE provision, as articulated in Sustainable Development Goal 4.2, which calls for increased *access to quality* early childhood education for all children by 2030 (emphasis added; United Nations, 2016).

Sustainable Development Goal 4.2's joint emphasis on access *and* quality is notable. It is a misconception that the 1990 World Conference on Education For All in Jomtien, Thailand, ignored quality in its push toward increased access to education. In fact, the documentation of the Jomtien proceedings specifically focused on quality (UNESCO, 1990). However, despite the emphasis on quality of education at Jomtien, the implementation of the Education For All movement routinely emphasized access at the expense of quality (UNESCO, 2004). It is uncertain how much of the decrease in primary education quality in the 1990s was due to the expansion of the school-going population from the elite to a wider representation of society. In Ethiopia, for example, "aggregate enrollments in grades 1–12 rose at a steady pace of about 9 percent a year between 1992–1993 and 2001–1002; and in grades 1–4, the first cycle of primary schooling, they grew even faster: at 15 percent a year" (World Bank, 2005, xxiii).

Learning outcomes in this period did not improve, and in some measures dropped, as measured by Ethiopia's National Learning Assessments (Federal Democratic Republic of Ethiopia, 2013). Thanks to Education For All, education was no longer a privilege of the wealthy, yet education quality was tenuous.

Similarly, Sustainable Development Goal 4.2 has become a rallying cry for ECDE advocates and has ignited a global movement toward expanding ECDE. As with primary education, the complexities of balancing increased access to ECDE with the quality of the ECDE provided a crucial challenge in many countries. Some national governments have recently enacted policy changes to transition the ECDE subsector to decentralized management. For example, in Kenya, after the advent of the 2010 Constitution (Republic of Kenya, 2010a), ECDE was devolved to the county governments and provision of ECDE resources had to occur within the context of scarce local funds for social sectors. Ethiopia and China are other examples of large low- and middle-income countries that implement ECDE through decentralized technical management and resource allocation.

Kenya's guiding policy document for devolved ECDE is being developed at the national level and is in the final stages of completion. Without completed guidance, county-level ECDE officials are unclear about their authority to determine and implement devolved ECDE policies. Instead, given the fungibility and scarcity of devolved funds, ECDE officers often focus on ensuring a reasonable allocation of resources for their subsector. The typical emphasis has been on access: establishing ECDE classrooms next to

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primary schools and stand-alone ECDE centers and hiring teachers. Some counties have invested nearly all their resources on construction and hiring and have had little left to purchase teaching and learning materials or to induct, develop, and support ECDE teachers. In fact, county- and national-level officials have continued to disagree on whether the responsibility for hiring teachers is with the devolved counties or with the national level, and several court cases have ensued (see media coverage at Macharia, 2016). With limited resources allocated to materials and pedagogical support for teachers, it is unsurprising that the quality of ECDE provision in Kenya is at risk.

In this context, the Ministry of Education and four counties began implementing the Tayari program (2014–2018), with sponsorship from the Children's Investment Fund Foundation and technical support from RTI International. Tayari, which means "Ready" in Kiswahili, is designed as a randomized controlled trial to determine the most cost-effective ECDE intervention that can be scaled and sustained. The Tayari external evaluation is studying the impact of three Tayari treatment groups in comparison to a control group on improved school readiness. Implemented in 2,100 ECDE centers and supporting more than 120,000 learners in the 2018 academic year, Tayari is testing the ability of the devolved systems in four of Kenya's 47 counties to implement and manage a large-scale ECDE quality-improvement program in the context of devolved ECDE.

In addition, Tayari has two studies under way: a qualitative study of counties' decision-making and a quantitative longitudinal tracer study of children's performance over time. The longitudinal study investigates whether and how one of the treatment arms of Tayari has an impact on school readiness,[1] as judged by changes in the tested skills of Tayari children. The qualitative study measures how the Tayari

intervention is changing devolved decision-making in Tayari counties and how non-Tayari counties make resource allocation decisions. Interviewers have collected data from officers at several levels of the devolved system in both Tayari and non-Tayari counties.

Literature Review
Access and Quality
Over the past two decades, education policy makers globally have increased emphasis on ECDE, as the scientific community continues to generate convincing evidence regarding the critical importance of the early childhood period in determining later school and life success.[2] International aid agencies, such as the World Bank and the United Nations Children's Fund (UNICEF), are encouraging developing countries to expand provision of preprimary education and to improve the quality of those services (Sayre, Devercelli, Newman, & Wodon, 2015; UNICEF and World Bank Group, 2016). In response to the growing demand for ECDE in their own contexts, and to the compelling scientific and economic evidence about the return on investing in young children (Heckman, 2006; McCoy, Zuilkowski, Yoshikawa, & Fink, 2017), several countries in sub-Saharan Africa have both expanded the provision of quality preprimary education and undertaken policy reforms to achieve this expansion in efficient ways.

Decentralization and ECDE
As governments grapple with the goal of achieving universal access to ECDE by 2030, parallels to the universal primary education (UPE) movement in the late 1990s are instructive. That movement did not sufficiently engage decentralized governments to devise local solutions that would increase access while also improving quality. Thus, some countries, such as Kenya and Ethiopia, are now combining two efforts concerning ECDE: decentralization

of authority and funding to local governments, and the development of guidelines to ensure high-quality implementation.

With the global expansion of ECDE services, researchers who focus on quality improvements have begun to apply approaches from education systems research to preprimary education (see Powers, 2016, on the Early Learning Partnership program). Rossiter (2016) summarized the consensus of international literature on six elements of high-quality ECDE at the system level. The elements are

1. equitable and inclusive access;
2. curriculum, plus teaching and learning materials;
3. teachers and school leaders;
4. parental and community support and engagement;
5. standards, monitoring, and learning; and
6. systems, financing, management, and leadership (Rossiter, 2016, p. 6).

Countries with scarce education resources and limited capacity struggle to manage all six of these elements of quality and have taken various governance approaches to do so (Rossiter, 2016). More specifically, local education systems often have limited financial resources and lack qualified technical personnel to implement decentralized ECDE. Utilizing the Rossiter (2016) framework allows those interested in the impact of decentralization on education quality to examine it systematically.

Before discussing the present study in Kenya, we consider four cases of decentralized governance of ECDE systems in the following countries: Ethiopia, China, South Africa, and Zimbabwe.

Decentralized management of ECDE investment in Ethiopia

The Federal Democratic Republic of Ethiopia is a geographically large and populous country of more than 100 million people, governed through a federal system. Ethiopia's federal government develops policies while nine regional governments and two city administrations implement them. Funding for the ECDE subsector is included in a block grant to the regional level, and regional governments decide how to use that funding in the context of scarce resources in other education subsectors. Recent research has examined the implementation of Ethiopia's decentralized ECDE policy (Woodhead, Rossiter, Dawes, & Pankhurst, 2017). The national-level sector plan for education, called the Education Sector Development Programme (ESDP) V (Federal Ministry of Education, Ethiopia, 2015) has ambitious objectives for expanding access to preprimary education (called "O class"). The plan calls for ECDE enrollment of 4- to 6-year-olds to increase from 35% of the eligible population in 2015 to 80% by 2020. Given Ethiopia's decentralized governance structure, the ESDP V does not give detailed instructions on how to achieve those objectives to the Regional State Education Bureaus (RSEBs) that implement the policy. The lack of detailed implementation guidance makes sense given the wide range of regional structures in Ethiopia; for example, Oromia region alone is geographically larger than many entire sub-Saharan African countries, while Harari region encompasses not much more than the town of Harari itself.

Woodhead and colleagues (2017) concluded that the key factors influencing RSEBs' ability to operationalize the guidance from the national sector plan depended on (a) their preparedness to deliver ECDE (i.e., their skills, training, attitudes, and support from the educational apparatus above); (b) their past, present, and future plans for ECDE; (c) their training, deployment, remuneration, and supervision processes for ECDE teachers; and (d) the available standards and current

resourcing levels available for ECDE classrooms, which in turn depend on the regional allocations of the block grant funding. They also noted that all RSEBs faced the same constraints: no budget initially allocated for ECDE services, shortage of qualified personnel, little federal guidance on implementation standards, modest financial and human resources available for monitoring and supervision of ECDE quality, and a scarcity of trained teachers available to teach O class, particularly in the more remote regions.

As the 1994 Education and Training Policy (Federal Democratic Republic of Ethiopia, 1994) suggested, and as is the case in any truly decentralized system, each RSEB responded to the challenges differently, with some creative solutions. These included drawing upon community resources to construct ECDE classrooms; supervising private providers, who served large populations in some regions; developing low-cost teacher training plans in the context of scarce resources for expensive trainings; building stand-alone O-class facilities alongside existing primary schools; and specifically targeting indigenous groups and girls, who were previously less likely to enroll (Woodhead et al., 2017). These regionally developed and specific solutions were uniquely implemented across the country. As of early 2018, it is still too soon to measure the impacts of these varied solutions for specific regional problems. Nonetheless, understanding the effectiveness of the solutions developed by these decentralized actors will be essential for Ethiopia's improved ECDE provision, as well as for other countries learning from Ethiopia's experience.

Decentralized management of ECDE in China

China faces challenges similar to Ethiopia's in terms of inequitable access to ECDE services and variable ECDE quality throughout the country. In China, local governments are responsible for funding and managing preprimary education. This decentralized system of finance has allocated the heaviest financial burdens to the lowest levels of government, particularly county governments in rural areas, and district government in municipalities (Wu, Young, & Cai, 2012), which have the fewest available resources to pay for quality ECDE (Zhou, Sun, & Lee, 2017).

China's dependence on local (municipal or provincial) resources for ECDE provision has led to worsening regional disparities in both access and quality. For example, in Shanghai, the municipal government allocated nearly 8% of its education budget to the preprimary level, which reached an enrollment rate of 98% of 3- to 6-year-old children (Feng, 2017). However, poorer and more rural regions and municipalities, such as Zhejiang, devoted much less of their public funds to preprimary education, and, as a result, 80% of services came from private, fee-bearing kindergartens, which placed lower-income families at a disadvantage (Feng, 2017). Feng (2017) also argued that, in China, with the devolution of responsibility to provincial governments, the central government did not exert sufficient control in terms of regulating the development of preschool education across provinces, among different regions in a province, and between urban and rural areas.

The Chinese and Ethiopian examples show that decentralization can have positive and negative effects. On the one hand, local governments can seize the opportunity to innovate, as some Ethiopian regions have done. However, without sufficient ECDE-related capacity at the local-government level, innovation is unlikely. On the other hand, depending fully on local financing for ECDE provision, as in China, may increase inequality because poorer areas may devote fewer resources to preprimary education, thereby limiting poor households' access to high-quality, low-cost services (Feng, 2017; Zhou et al., 2017).

Rapid expansion of ECDE in South Africa

The literature on rapidly expanding ECDE in sub-Saharan Africa provides two recent examples useful for understanding how quality and access are balanced in contexts with limited resources and ambitious goals. South Africa formally established a preprimary or "reception year," Grade R, as an integral part of its public primary school system in 2001, and steadily increased ECDE enrollment by 11 percentage points per year from 2001 through 2008 (Biersteker, 2010). By 2013, South Africa's statistics showed that an impressive 94% of Grade 1 learners had attended Grade R (Department of Planning, Monitoring, and Evaluation, Republic of South Africa, 2014, p. 49).

Unfortunately, this rapid expansion of free grade R in public primary schools severely harmed the community-based providers that charged fees. These community-based providers were an important option for many families because they provided a full day of care, whereas the public Grade R provided only half a day (Garcia, Pence, & Evans, 2008). Of additional concern was that results from early grade reading assessments in South Africa during this period of expanding ECDE access showed very low basic skills for children entering Grade 1 (Piper, 2009). This suggests that the cost of diminished quality due to the rapid expansion of ECDE might have been similar to the financial cost of the expansion.

Decentralized expansion of ECDE in Zimbabwe

Zimbabwe took a different approach to rapidly expanding ECDE services in the country. Before 2003, all ECDE services in Zimbabwe were provided by local authorities, private organizations, nongovernmental organizations (NGOs), and religious organizations rather than by the Ministry of Education. The Ministry's role was setting policy guidelines for the entities that provided ECDE services (Mangwaya, Blignaut, & Pillay, 2016). Those policy guidelines were not accompanied by systems to oversee the quality of the implementation (Mangwaya et al., 2016). Quality of ECDE was therefore variable, and access was limited to wealthier households, primarily in urban areas.

Recognizing the need for more uniformity, oversight, and greater access to ECDE services throughout the country, the Ministry of Education undertook a policy revision in 2004. The government of Zimbabwe issued a new policy that all primary schools should open at least two preprimary ("grade 0") classes in 2004, even though the formal primary education system had previously played no role in ECDE provision. Mangwaya et al.'s (2016) qualitative study examined the implementation of this new policy and the obstacles encountered in the provision of ECDE at the school level. The study concluded that although classroom teachers were adequately qualified to implement ECDE, school heads were not prepared to support teachers' implementation of ECDE. The researchers also found that insufficient teaching and learning resources and a lack of ongoing teacher support contributed to low-quality ECDE provision (Mangwaya et al., 2016). The Zimbabwe case appears to be one in which the decentralization of ECDE was not sufficiently integrated with the additional financial and technical resources required to provide high-quality ECDE.

Research Questions

The literature reviewed above showed several models of decentralized provision of ECDE, but they lack consensus on how to balance ECDE *access and quality*—the same problem identified during the period in which primary education rapidly expanded. Assuring quality during rapid expansion is even more challenging in

decentralized environments, given the variability in needs and capacity across diverse geographies, which can potentially worsen inequality. Moreover, the literature is relatively silent regarding whether and how high-quality ECDE interventions can affect resource allocation at the decentralized level. To fill those gaps, we proposed the following research questions:

- RQ1: How do education officials at devolved levels in Kenya make decisions about resource allocations in ECDE?
- RQ2: How do education officials at devolved levels in Kenya make decisions about the implementation of policies regarding ECDE quality?
- RQ3: Does the impact of the Tayari intervention differ by devolved location?

Background

Kenya Background

Kenya is a lower-middle-income country with an estimated population of just over 48 million, with the last census identifying 38.6 million (Republic of Kenya, 2009). Education in Kenya is governed by the Constitution, which in Article 53 affirms the right to free compulsory basic education (Republic of Kenya, 2010a). The Basic Education Act affirms that basic education includes two years of preprimary education: preprimary 1 serves children aged 4 years; preprimary 2, children aged 5 (Republic of Kenya, 2013). The Ministry of Education is preparing to launch a revised pre-primary education policy (Ministry of Education, Kenya, 2017) and ECDE is a key part of the National Education Sector Plan (2013–2018), which is the guiding document in the education sector (Republic of Kenya, 2010b).

Access to ECDE has dramatically increased in Kenya in the past decade, as indicated in Table 1. As of 2014, the gross enrollment ratio (GER) was 73.6% nationally, with a net enrollment ratio (NER) of 71.8% (Ministry of Education, Kenya, 2014). The gap between the GER and NER was small at the national level and in most of the counties where the data were collected for this study. Laikipia County was a notable exception, with a GER 32.4 percentage points higher than its NER, suggesting that late entry into ECDE is problematic in that county.

Table 1

Kenya's Gross and Net Enrollment Ratios for ECDE, by County and Nationally, 2014

County	Gross enrollment ratio (%)	Net enrollment ratio (%)
Embu	50.8	47.5
Laikipia	79.9	47.5
Marsabit	51.5	50.5
Mombasa	66.8	65.9
Nairobi	76.2	65.9
Siaya	73.5	71.4
Uasin Gishu	60.8	59.7
National	**73.6**	**71.8**

Source: Ministry of Education, Kenya (2014).

Table 2
Numbers of Public and Private ECDE Centers and Learners Enrolled, 2014

County	Number of ECDE centers			Enrollment		
	Public	Private	Total	Public	Private	Total
Embu	411	236	647	15,920	7,318	23,238
Laikipia	317	192	509	22,527	9,232	31,759
Marsabit	175	79	254	12,580	4,738	17,318
Mombasa	110	586	696	8,030	46,846	54,876
Nairobi	213	1,841	2,054	14,793	177,977	192,770
Siaya	744	150	894	56,477	8,474	64,951
Uasin Gishu	498	313	811	39,049	19,455	58,504

Source: Ministry of Education, Kenya (2014).

The balance of state and non-state provision of ECDE differs by urban and rural geographies in Kenya. Most counties provide ECDE to their young children primarily through public ECDE centers. Table 2 shows that in Laikipia, for example, in 2014, many more learners were enrolled in public than private centers. In Nairobi and Mombasa, the largest cities in Kenya, the relationship was the opposite, with more pupils attending private ECDE centers than public ones. In any case, these enrollment ratios are higher than those from other countries in the region (McCoy et al., 2017), although the country is now emphasizing the need for increased access to ECDE due to greater demand from parents or other caregivers.

Tayari Background

The Tayari intervention was designed to investigate whether devolved government structures can be supported to improve the quality of ECDE, with a focus on cost-effectiveness at the devolved level. The treatment design relies on the county governments' education officers, called ECDE coordinators, to provide training to each of the preprimary 1 and preprimary 2 teachers within randomly selected zones and to provide ongoing instructional support to teachers utilizing the new methods supported by Tayari. The ECDE coordinators use tablets with coaching tools to help them give feedback to teachers implementing Tayari in classrooms. The data from those tablets are aggregated and presented in a visual "dashboard," which the ECDE leaders in each county use to manage and supervise Tayari's implementation quality. Based on the learning areas in the Kenyan curriculum, children are provided with workbooks in language and mathematics to support their daily learning. Teachers receive teachers' guides in language, mathematics, and social and life skills to support their instruction. The teachers' guides match the learner workbooks to support the teachers' delivery of each individual lesson in the workbooks, which simplifies teachers' instructional practice.

Tayari has supported county-level ECDE leaders to improve the quality of ECDE provision and to use existing personnel to prioritize quality improvements. This approach

has resulted in these officers dramatically increasing the proportion of time they spend doing classroom support. It has also helped two of the Tayari-supported counties to use their own resources to increase the number of personnel who help with ECDE implementation. In Laikipia and Siaya, the county-level decentralized system increased the number of ECDE officers by 10 and 6 respectively; these numbers represent a substantial increase in the officers working on ECDE. The two other counties were relatively well staffed with ECDE officers before Tayari's implementation.

Research Design

The overall design of the Tayari program is described in the section above. In this section, we present the research design for the two main data sets used in this analysis.

To answer our research questions, we first examined qualitative interview and focus group discussion data collected from devolved ECDE leaders in Kenya. Using a structured interview protocol, the Tayari program researchers collected interview data from 51 respondents through in-depth interviews with policy makers at the national and county levels and focus group discussions with technical officers at the county level. The interviews, conducted between November 2016 and February 2017, explored how county-level personnel made decisions on resource allocations, whether a quality-improvement program such as Tayari could have an impact on the allocation decisions made at the county level, and in what ways that impact would be evident.

The non-Tayari counties were selected by the Ministry leadership based on similarities to other counties in terms of their ECDE provision and quality; similarly, the counties that would implement Tayari were chosen based on the Ministry's view of the status of ECDE across the country. For the qualitative study, interviews were conducted by policy experts and monitoring and evaluation staff from the Tayari program. The research team interviewed senior officials of the national education system and policy representatives from the four Tayari counties and three selected non-Tayari counties. Among them were national ECDE policy leaders, county-level ECDE leaders, and individuals who developed and managed the policies regarding ECDE at both levels. The interviews focused on the role of the specific officers in overseeing the policy aspects of ECDE, included respondents at both the national and county levels, and from Tayari and non-Tayari counties (see Table 3).

Table 3

Sampling of Respondents for Qualitative Data Collection

Area of interest	National leaders	Representatives from Tayari counties	Representatives from non-Tayari counties
Policy	2	7	3
Technical	2	22	15

Manual transcription of the audio data files was done by research assistants, and the data were coded by Tayari senior research staff. The coded data were analyzed using the NVivo qualitative data analysis software. Coding of the transcripts was done to ensure that queries were easily run using the NVivo analysis software.

In the next section we present qualitative and quantitative data from the longitudinal study designed to estimate the impact of Tayari on school readiness. To generate an unbiased estimate, the Tayari longitudinal evaluation randomly selected zones of public schools from each of the four counties, as well as low-cost private institutions in the nonformal settlements of Nairobi,[3] and randomly assigned them to treatment and control groups. All schools in each zone implemented the same treatment, but for the purposes of the longitudinal evaluation, schools were randomly selected for inclusion in the study. The Tayari team then followed a set of children from the January 2016 baseline period to the October 2016 midline assessment to determine how their school readiness outcomes changed over time. The resulting data set contains information collected from 2,891 children at the preprimary 1 (4 years old) and preprimary 2 (5 years old) levels at both the baseline and midline assessment, making it one of the largest ongoing longitudinal studies of school readiness in sub-Saharan Africa.

To estimate the effect of Tayari on school readiness, we fit a regression model in the Stata statistical package. The outcome variable was a composite called *school readiness,* which indexed school readiness across a set of 10 outcomes that were determined by the Ministry

of Education and an external evaluator. The regression model estimated October 2016 school readiness levels, controlling for school readiness scores at the January 2016 baseline. The parameter estimate on the treatment variable was the causal effect of Tayari. We present regression coefficients for the treatment variable in models with and without control variables. Control variables included grade, gender, county, and age. In addition, we fit regression models for each grade, for each county, for both genders, and for public and APBET institutions to determine whether the effects of Tayari were moderated by these control variables.

Findings

We have organized our findings based on the six elements of high-quality ECDE described by Rossiter (2016).

Research Question 1: Systems, Financing, Management, and Leadership

Our first research question prompted us to investigate how county-level staff make decisions about resource allocations in the context of decentralized decision-making in Kenya. The interview and focus group data analysis indicated that all the assessed counties received unrestricted block grants from the central government to support county functions, including ECDE. These block grants depended on a formula that identified population as one of the key criteria. The respondents noted that Members of County Assemblies (MCAs) have the final say in deciding how much money is spent on particular sectors, including ECDE. MCAs are legislators in the county parliament (i.e., the

County Assembly). One of the roles of MCAs is to approve county budgets. Although the MCAs make the final decisions, there is nominal public participation in the discussions on the County Integrated Development Plans, where technical officers, including those with expertise in ECDE, give their input. The interviews revealed that some counties have supplemented the funding from central government with revenues collected at the county level, although the percentage of this funding allocated to the ECDE subsector was unclear. Table 4 shows the allocation of block grant revenues to the researched counties between fiscal year (FY) 2015/16 and FY 2016/17.

To understand how decisions on ECDE were made, we examined the process by which the block grant amounts were allocated to particular sectors. The results showed that ECDE funds were combined under the education department, which also comprises vocational education—another devolved function. This combination of educational subsectors makes it somewhat difficult for counties to allocate sufficient resources to ECDE given that the choices between those subsectors might be influenced by non-technical decisions.

One of our key objectives in examining the county-level allocation of resources was to establish the overall amount of resources spent on ECDE per county, and then to disaggregate that amount by expenditure type. As mentioned earlier, anecdotal evidence suggested that the predominant expenditure in the ECDE subsector was construction, so the data collection team focused on collecting information about construction expenditure by county. Table 5 shows the results of the data collected from six of the seven counties.[4] The first several rows show expenditures by type. The *Total* row shows how much was spent, and the *Per student* row takes the overall amount spent in the past three fiscal years and divides it by three times the 2014 enrollment figure (latest available data) to give an approximate per student cost during that period.

Table 4

Allocation of Block Grant Revenue to Counties in FY 2015/16 and FY 2016/17, in Millions of Kenyan Shillings (KES)

| | Revenue allocations by fiscal year | |
Counties	FY 2015/16	FY 2016/17
Tayari counties		
Laikipia	3,449.5	3,722.1
Nairobi	12,996.6	14,023.5
Siaya	4,995.3	5,390.0
Uasin Gishu	5,190.9	5,601.0
Non-Tayari counties		
Embu	3,837.9	4,141.2
Marsabit	5,189.5	5,599.5
Mombasa	5,197.1	5,608.6

Table 5

County Expenditures on Public ECDE (KES Millions)

Expenditure item	Embu	Laikipia	Marsabit	Mombasa	Siaya	Uasin Gishu
Construction	139.0	23.7	0.0	144.5	280.0	298.6
Instructional materials	16.0	0.0	3.0	50.0	0.0	10.0
Quality assurance	0.0	0.0	12.2	0.0	0.0	2.6
Teacher training	5.0	0.0	2.5	0.1	0.0	2.4
Teacher support	2.0	0.0	0.0	0.7	0.0	0.0
Health and nutrition	0.0	0.0	33.5	219.8	0.0	0.0
Total (KES millions)	**162.0**	**23.7**	**51.2**	**415.2**	**280.0**	**313.6**
Per student (KES)	3,392	351	1,357	17,235	1,653	2,677

The disparities in ECDE expenditure are striking. Mombasa spent approximately 17,235 KES per child during this fiscal year while Laikipia spent 351 KES per child. Although the block grant was ostensibly based on population, Mombasa was spending 49 times as much on ECDE per child as Laikipia. The four counties that were closest in per child expenditure—Siaya, Uasin Gishu, Embu, and Marsabit—still had wide disparities, as Embu was spending 2.5 times as much per pupil as Marsabit.

When we considered the types of expenditure, we found that most of the counties spent most of their funding on infrastructure, with construction as a top priority. Embu spent 85.8%; Uasin Gishu, 95.2%; Siaya, 100%; and Laikipia, 100%. The interviews revealed that investing in infrastructure was perceived to garner political capital for county-level elected officials. Therefore, much of the expenditure went into construction of ECDE classrooms, as indicated in Table 5. Notably, Mombasa County decided to construct ultra-modern model ECDE centers. Each model ECDE center would have classrooms, offices, a clinic bay, a student play area with equipment, a kitchen, and an eating area. Eight such model centers, costing approximately 29 million KES each, were under construction in 2017. This information explains the potentially misleading high *Per student* cost in Mombasa, indicated in Table 5 as 17,235 KES per student. Thus, county decision-makers focused on higher-quality construction covering a far smaller number of children in that year, and in doing so increased inequality between those children enrolled in the model centers and those in other settings. Unfortunately, investing in infrastructure alone is unlikely to have a direct and immediate impact on learning outcomes.

The county-level expenditure data as well as the recorded interview responses revealed that counties spent minimal or no funding for interventions that could promote improved teaching and learning. For instructional materials, two counties did not budget any money at all, and three other counties budgeted less than 10% on materials. Only two counties budgeted for quality assurance, although Marsabit invested nearly a quarter of its resources in this area. The counties that budgeted for teacher training did so at 3% or less, and teacher support was absent altogether from four counties' budgets. Only Marsabit and Mombasa invested in health and nutrition, and the investments were more than 50% of the county ECDE budget in both cases. Marsabit County, aware of the nutritional deficiencies of

some of its citizens because of naturally arid lands compounded by a recent drought, leveraged the existing school meals program to provide ECDE learners with a nutritious meal. Mombasa County, on the other hand, paid to provide 250 ml of milk daily to learners in ECDE and those in primary grades 1–3. These investments reflect the realities in each county, both political and practical.

In summary, these results showed very modest investment in efforts to improve the quality of ECDE. The decision-makers at the county level typically did not see ECDE quality improvements as a priority for the governor, to whom they were responsible.

Research Question 2: County-Level Decision-Making
Teachers and school leaders
For our second research question on ECDE decision-making at the county level, we found that each of the counties had established ECDE departments with full-time, county-paid employees supporting the subsector. There was wide variation in the backgrounds of the personnel employed, with Nairobi County having a much more qualified ECDE subsector staff. The issue of hiring teachers for ECDE centers became contentious because of a disagreement at the national level regarding whether teachers should be selected and paid at the national or county level. In 2016 and 2017, the county governments hired temporary teachers, resulting in wide variation in teacher qualifications and salaries paid to ECDE teachers by county, a situation which can lead to teacher turnover due to cross-county transfers. At the time the data were collected, the national-level Teachers' Service Commission was working with the counties to develop schemes of service, which is the Kenyan mechanism for clarifying roles and responsibilities for teachers as well as specifying the criteria for their selection and hiring. Each county had instituted a minimum qualification for ECDE teachers at the certificate level,[5] ensuring that each trainee would have

exposure to key ECDE topics, whether they attended a public or private teacher training facility.

Curriculum, plus teaching and learning materials
When the research team asked respondents to describe the mechanisms for developing, purchasing, and distributing instructional materials for ECDE centers, there was near unanimity that the counties were investing very little of their resources in these materials. The selection of materials happened both at schools and at the county level. In some counties, the selection was done through a school management committee; in others, by the county office. Furthermore, the language-of-instruction policy for ECDE calls for use of the "language of the catchment area" (or local community), but some schools had chosen materials that ignored the local language policy and were using English instead. Most counties had no budget line for instructional materials, and in those settings, material purchases became the purview of individual schools, which often passed along the cost to parents in the form of additional fees. This finding suggests that access to appropriate materials likely was inequitable, since schools with more wealthy parents were likely able to afford more and better materials.

Standards, monitoring, and learning
The findings revealed that most counties had no funds available for teacher training and support. This applied to both initial induction and ongoing short courses or refresher trainings. Preprimary teachers were expected to have undergone at least two years of training at either the certificate or diploma level. In-service training was offered during school holidays. Although structures had been established to provide ECDE teacher trainings and support (a National Center for Early Childhood Education, District Centers for Early Childhood Education), these structures were not activated after devolution, since their staff had been redeployed

by the national Teachers' Service Commission to other jobs. Some ECDE trainings continued on an ad hoc basis, but the Ministry of Education has since stated that primary teacher training colleges will be responsible for such training in the future.

In short, beyond the trainings and capacity-building programs implemented in donor-funded programs, teachers in the counties had no access to additional ECDE training. Similarly, none of the counties interviewed had an organized teacher support structure, including a transportation budget that would allow ECDE officers to offer classroom-level mentoring and support to teachers.

Parental and community support and engagement

Our findings revealed significant demand for high-quality ECDE provision. The counties responded to this demand in a variety of ways, as did parents or caregivers. In urban areas, such as Nairobi, Mombasa, and Eldoret town in Uasin Gishu, demand was growing for what was perceived as high-quality ECDE in the informal settlements. Respondents indicated that many parents enrolled their children in APBET centers because they believed that the instructional quality was higher than in public schools. This held true even if the physical facilities that the APBET institutions occupied were not much more than a tin roof and bare walls. The county-level respondents noted that there were "better conditions" in these private institutions, referring to the quality of the teachers and availability of learning materials other than just walls and chalkboards. The study revealed a contrast in terms of what county-level decision-makers and parents prioritized: The former expressed interest in investing in ECDE infrastructure to garner political support, while the latter in fact preferred centers that had

invested in better teaching and learning materials (even with lower quality infrastructure).

Equitable and inclusive access in the health subsector

In this section, we have expanded Rossiter's (2016) discussion on equitable and inclusive access to include the health subsector, as we sought to specifically examine how counties engaged with health structures. When the Tayari research team asked about the availability of child health programs in the county for ECDE-aged learners, they found no counties that were directly implementing child health programs in schools. Instead, counties were collaborating with the Ministry of Health structures and donor-funded NGOs operating in their jurisdiction. Counties were supporting feeding programs at the ECDE level by providing basic meals and milk at the ECDE center on an ad hoc basis. Although they had limited resources to pay for health register data collection, most counties did not regularly use registers to collect child health data at the ECDE centers. The respondents indicated that teachers used exercise books to capture some health data, but the county-level data suggested wide variation in how these registers were being completed. Finally, the findings showed that both handwashing and hygiene practices were taught at the county level in ECDE classrooms in Tayari pilot counties, but the connection between the county-level policies and the ability of teachers in that county's ECDE centers to formally implement these practices was very weak.

Willingness of Tayari counties to change allocations

Up to this point we have discussed our data using Rossiter's framework (2016) on high-quality EDCE. Further analyses sought to

Table 6

Numbers of ECDE Officers, by Type of Qualification and County

Counties	Type of qualification			Total
	Degree	Diploma	Certificate	
Tayari				
Laikipia	7	6	3	16
Nairobi	20	9	0	29
Siaya	7	0	0	7
Uasin Gishu	3	3	2	8
Non-Tayari				
Embu	5	0	0	5
Marsabit	7	2	0	9
Mombasa	6	2	0	8
Total	**31**	**10**	**3**	**40**

Note. All of these are academic professional qualifications. A bachelor's degree in early childhood education or equivalent in local university takes four years. Currently, both diploma and certificate courses take two years in a college.

determine whether any of the decentralized ECDE leaders suggested that the instructional interventions implemented by programs like Tayari would likely have an impact on resource allocation and decision-making at the county level. The Tayari theory of change suggests that if county-level officers work with a program like Tayari, which focuses on improved instructional quality, then these officers will better understand the impact that their resource allocation decisions can have on education quality. The qualitative interviews indicated that the county governments had established ECDE sections and had staffed them with qualified personnel. Most of these officers had a four-year university degree in early childhood education, as opposed to a one- or two-year certificate or diploma. As Table 6 shows for the end of the program's first year, Tayari counties employed more ECDE officers than non-Tayari counties. Our findings also revealed that the Tayari counties had hired even more ECDE officers

over time, as Tayari's implementation evidently led them, in part, to recognize the importance of classroom support**.**

Research Question 3: Tayari's Results by Decentralized Location

The sections above presented findings related to how decentralized counties responded to technical implementation of ECDE in Kenya. Given the differences in each county's technical implementation, our third research question prompted us to investigate whether the effect of Tayari on school readiness would differ by decentralized location. To answer that question, we fit a set of regression models. The outcome variable was school readiness in October 2016, and we controlled for initial school readiness from the January 2016 baseline assessment. Table 7 presents our findings.

The first two columns present the overall estimates of Tayari's impact on school readiness, with the first presenting the overall impact without control variables, and the second presenting the Tayari impact with control variables. The first row shows the effect of Tayari on school readiness, which is an index with a score out of 100. The second row shows the effect of Tayari on the percentage of children who reached the benchmark of 40% on the school readiness index.

The results show that Tayari increased overall school readiness by 5.1 index points (*p*-value < .01), and 9.6% more children met the school readiness benchmark (*p*-value < .01) in Tayari treatment schools than in control schools. The overall estimates were very similar when the model with control variables was fit, with 4.9 index points higher on school readiness (*p*-value < .01) and 9.3% more children reaching the benchmark in treatment than control schools. Tayari improved overall school readiness scores and increased the overall percentage of children reaching the benchmark. The *With control variables* column shows that the impact of Tayari was not sensitive to the inclusion of control variables. The next several columns show that the impact of Tayari did not meaningfully vary by grade, gender, or school type.

The next several columns were designed to determine whether the impact of Tayari depended on the decentralized county. As the results in the *Public* column show, we found that the impact of Tayari on public schools in the four counties together (5.2 index points, *p*-value < .01) was very similar to the impact of Tayari on the APBET schools (5.7 index points, *p*-value < .05).

Given that the four counties in Tayari implemented ECDE separately, we also wanted to determine whether the impact of Tayari differed for the four counties. We found differential effects by county (we do not share the county names for reasons of sensitivity of the information). County 1 and County 3 had statistically significant impacts on both *school readiness* (*p*-value < .05 and *p*-value < .05) and the *percentage at benchmark* (*p*-value < .01 and *p*-value < .05). County 2 and County 4 had no impact on either *school readiness* or the *percentage at the benchmark*. County 2 had estimates similar to those of Counties 1 and 3; although they showed statistical significance, the larger standard errors in County 2 made those estimates statistically insignificant. In summary, we did see differences in the impact of Tayari across the four decentralized counties and between the public schools and the APBET institutions.

(Table 7, Next Page)

Table 7

Regression Estimates of Tayari Treatment Effects on School Readiness (standard errors in parentheses)

Item	Without control variables	With control variables	PP1	PP2	Combined class	Male	Female	Public	APBET	County 1	County 2	County 3	County 4
School readiness (difference in index points)	5.1** (1.4)	4.9** (1.3)	4.6* (2.0)	4.5* (1.9)	7.2** (2.3)	5.2** (1.7)	4.9* (1.3)	5.2** (1.5)	5.7* (2.2)	7.9* (2.1)	5.8 (4.7)	5.9* (2.2)	2.7 (1.9)
% at benchmark	9.6** (2.7)	9.3** (2.4)	8.6* (4.2)	7.4~ (4.4)	16.2** (4.9)	7.3* (3.3)	12.2** (3.4)	9.8** (2.8)	10.7~ (5.2)	15.9** (3.5)	12.8 (10.3)	8.8* (3.2)	7.5 (4.7)

Note. APBET = Alternative Provision of Basic Education and Training (nonformal) schools; PP1 and PP2 = preprimary 1 and preprimary 2.

$\sim p < .10$, *$p < .05$, **$p < .01$, ***$p < .001$.

Discussion

The data available from the Kenya Tayari ECDE program provided a unique opportunity to investigate how ECDE works in a devolved setting at scale, with resource allocation power devolved to the lower levels of government. We framed our discussion of the results around our three research questions, which considered various factors relating to the implementation of ECDE in a truly decentralized system such as Kenya's.

The rich qualitative data we collected allowed us to investigate Kenya's devolved system with respect to the qualities outlined in Rossiter's (2016) work. In the areas of systems, financing, management, and leadership, the results showed that expenditure decision-making was often done to ensure electoral returns. The interviews and focus group discussions were held just a few months before the county-level elections took place in August 2017, and it appears that electoral concerns heavily influenced how ECDE allocations were made. The results also suggested that ECDE was a relatively low priority in most of the counties studied. Significant disparities existed between counties, with per learner expenditures several times higher in some counties than in others. Interestingly, while construction of new ECDE centers was the highest expenditure for five out of the six counties researched, the data indicated that parents' perceptions of education quality were instead centered on teacher quality and education resource materials, areas where the counties invested little if anything. The parental and community support and engagement portion of Rossiter's (2016) framework suggests that a decentralized ECDE structure may exacerbate inequalities, as per the China example. Wealthier counties and areas within those counties can supplement ECDE investments, while the poor and rural counties and portions of counties cannot.

Rossiter's (2016) framework analyzes the ways in which ECDE decision-making affects teachers and school leaders, and our data revealed important findings on how devolved ECDE systems addressed those areas. The findings showed that the counties were quite sensitive to the influence of a Tayari-type intervention on the hiring of ECDE officers after they were convinced of its potential impact on learning. Investing in teachers and improving the quality of teaching seems to be difficult in Kenya's current context, given ongoing legal disputes between the county and national governments regarding who is responsible for teachers.

The results showed several findings related to Rossiter's (2016) theme of curriculum, teaching, and learning materials. There were differences of opinion across and within counties as to whether the purchase of instructional materials was a county or school function. Given that many counties had no budget line allocated for instructional materials, schools took on some of that responsibility. Of course, when schools are required to provide materials, the availability of those materials to learners will be inequitable among schools, and the costs in many cases will be shifted to parents in the form of additional fees. It was also apparent that programs like Tayari that provide instructional materials are meeting an area of demand by counties and parents alike, although the long-term sustainability of this investment is of concern. Future quality improvement interventions could consider incentivizing county-level investments in learning materials, while also providing technical support. This strategy would call attention to the importance of such investments as meaningful resource allocations.

One of the most striking findings was the influence of Tayari on the allocation of personnel, due to the perception that investments in these staff would improve ECDE quality. Counties supported by Tayari had more ECDE officers than control counties, and two counties hired several additional ECDE officers before the 2017 academic year based on their experience with the Tayari program in 2016. These hires were paid from county resources and their positions became part of the permanent county budget. This increased personnel investment by the counties suggests an additional area of research on how project-based interventions can support decentralized levels in making decisions while also emphasizing learning and quality improvements. It remains to be seen whether the overall allocations of ECDE can be changed, whether it is possible to increase ECDE investments in contrast to other subsectors in general, and whether it is possible to increase ECDE investments focused on quality improvements rather than on access to ECDE.

The quantitative results from Tayari showed not only increased school readiness, but also meaningful county-level differences in program impact. While many programs focus primarily on whether an ECDE intervention is successful, these results showed that understanding the specifics of the context is essential in maximizing ECDE program impact. While the directionality of the Tayari impact was positive in each county, the variation in the magnitude of the county-specific Tayari effects points to the continued work required to consider local realities and make adjustments based on the particularities of implementation in decentralized levels in Kenya or elsewhere.

More research is needed to determine whether decentralized levels of government in Kenya innovate and create context-specific strategies (similar to the Ethiopian example) to improve quality. While the impact of Tayari was similar in public and nonformal settings, the absolute scores showed that outcomes were higher in the nonformal settings, outside of the government's formal investment. This finding reflects the experience of South Africa where outcomes in public Grade R classrooms are modest, and raises the question of whether rapid expansion of the public ECDE sector might reduce quality. The gap between the quality of public and low-cost private ECDE centers may be a cautionary tale for Kenya, which should ensure that investments in quality public ECDE centers are paramount even as enrollment in ECDE rapidly expands.

Conclusion

Decentralization affords countries a unique opportunity to improve both the quality and equity of ECDE service provision. The findings from this study point to the need for devolved or decentralized levels to allocate increased funding to ECDE to ensure government systems establish an effective and coherent ECDE system. Programs such as Tayari can produce evidence on how decentralized governments may utilize their existing personnel and structures to improve ECDE quality. This includes entrenching the use of high-quality instructional materials aligned to the curriculum, embracing teacher training and support modalities with a focus on ensuring that teachers effectively teach the curriculum, and improving instructional delivery through coaching and supportive supervision systems within the decentralized structures.

The Tayari example should be further analyzed to determine whether sufficient autonomy can be given to local, decentralized education structures to promote creative solutions and local ownership, while at the same time setting standards for training quality, instructional support, and decisions on resource

allocation. The key objective is to ensure that Kenya's children enjoy both high-quality ECDE and increased enrollment in the decentralized ECDE system.

Notes

1. We define *school readiness* as performance on the Kenya-adapted version of the Measuring Early Learning and Quality Outcomes (MELQO) assessment, with 10 areas of school readiness combined for an average school readiness metric, inclusive of language, numeracy, executive function, and socioemotional domains.

2. For an overview of scientific evidence around children's early development, see Committee on Integrating the Science of Early Childhood Development (2000); and *The Lancet* special series on Early Childhood Development in Developing countries, 2007, 2011, and 2016. 2007: http://www.thelancet.com/series/child-development-in-developing-countries; 2011: http://www.thelancet.com/series/child-development-in-developing-countries-2; 2016: http://www.thelancet.com/series/ECD2016

3. Low-cost private primary schools and ECDE centers in Kenya's nonformal or slum settlements are called Alternative Provision of Basic Education and Training (APBET) institutions.

4. The research team was unable to obtain expenditure data from Nairobi County.

5. Certificate level is the lowest professional certification for ECDE teachers. After completing a certificate, a teacher can attain a diploma and move on to a degree level.

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