



# **First Steps “Intera za Mbere” Holistic Parenting Education Program for families of children aged 0-3 years in Rwanda**

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## Executive summary

First Steps (*Intera za Mbere*) is a nationally-scalable approach to promoting healthy early childhood development by offering holistic parenting education to expectant parents and parents of 0-3 year olds in Rwanda. First Steps focuses on parents' support for physical, socio-emotional, cognitive and language development—with additional emphasis on the Rwandan priorities of avoiding family violence and cultivating foundational skills for emergent literacy in the home. The pilot phase of First Steps is focused on determining the most feasible and cost-effective approach to delivering parenting education, suitable for national expansion in the Rwandan context and effective in achieving improvements in parenting practices, child development indicators and emergent literacy promotion in the home.

From November 2015 to January 2016, a randomized control trial (RCT) to establish proof of concept is being conducted with 540 families in each of two different treatment conditions, plus a control group. The three trial conditions are: (1) two half-day trainings for a local volunteer, a basic package of materials and parenting education sessions facilitated by radio; (2) the above, plus provision of a larger package of materials and an additional training for the volunteer on how to use them; plus a salaried area facilitator supporting the local volunteers in guiding group sessions and conducting home visits; (3) Control group receiving no parenting education support. In addition to the above activities, all three groups will benefit from the same collaboration with local book publishers and booksellers.

The population for the RCT is all children aged 6 to 24 months in the Ngororero District of Rwanda, and ultimately 1,620 children and their caregivers were selected for participation in the study. This baseline study included measures of family characteristics and parenting behaviors as well as a child development assesment. Child development was measured using a Kinyarwanda version of the Ages and Stages Questionnaire (ASQ). The intention of this study was to investigate the baseline characteristics of families and children across the study groups, and to determine how comparable the study groups were in terms of family characteristics, home learning environments, and child development.

Results of this baseline study provided robust information about the family characteristics and child development of families in this study. There were scattered differences between the health practices of families in different study groups (e.g., vitamin A drop provision, feeding practices and handwashing) but groups did not appear substantially different in these areas. In addition, parents were asked about the frequency with which they engage in different activities with their children and no significant differences were found between study groups. The most frequent parent-child activities were taking children to see relatives, taking children to play outside, soothing children and criticizing or shouting at children. The least frequent were reading books, showing pictures books to child and playing inside with toys.

Parents were also asked whether they had been exposed to previous parenting interventions that had been offered by Save the Children or other local NGOs recently in Ngororero. On average, 7 percent of parents reported having attended a parenting session in the past year, 3 percent have received a home visit and 14 percent have heard a radio program about children. The only significant difference in exposure to previous programs was that parents in the full intervention group were more likely to have

participated in a community structure meeting than parents in the other groups. Participation in community structure meetings was investigated further and no significant differences were found between the development of children whose parents attended these sessions and those who did not. In general the exposure to previous interventions was low and even across study groups, suggesting that it will not substantially impact the results of this study.

Overall, children had the strongest skills in the area of gross motor development and the weakest in problem solving. Children in the light touch group had significantly stronger skills than children in the control group in fine motor, problem solving and personal-social development. Children in the full intervention group had significantly stronger skills than children in the control group in fine motor development. There were no significant differences between the skills of children in the light and full intervention groups. These baseline skill differences between intervention groups and the control group suggest that baseline skills should be controlled for during follow-up data collections in order to help account for these differences when looking at changes in child development over time.

Looking at trends in child development outcomes, analyses find that older children were less likely to meet ASQ benchmarks than younger children, and the steepest decline in skills was in the area of communication. In addition, using multivariate regressions to investigate predictors for children's development, the most pronounced finding was that children with parents who reported engaging with them in more play and stimulation activities were more likely to meet the ASQ benchmark for their age than children whose parents engaged with them less frequently. In addition, analyses found that children from wealthier households were more likely to meet the ASQ benchmark for their age group than children from poorer families in three of the five domains.

Findings from this baseline study confirm the importance of the First Steps program in Ngororero. Notably, of all activities that parents reported engaging in with their children, the least common were activities related to early learning and literacy. In fact, while 97 percent of mothers report playing with their children only 40 percent of mothers report ever telling stories to their children and 23 percent report ever showing them picture books. Further, the decline in older children's likelihood of meeting developmental milestones, especially with their communication skills, highlights the importance of helping parents better support their children's early language development. Therefore, data from the baseline study clearly display that the First Steps program's focus on raising parents' awareness of the importance of engaging verbally with their children, teaching them effective techniques for doing so, and providing greater access to child-friendly print materials are well suited to the needs of young children and their families in the intervention area.

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## **I. Introduction**

First Steps (*Intera za Mbere*) is a nationally-scalable approach to promoting healthy early childhood development by offering holistic parenting education to expectant parents and parents of 0-3 year olds in Rwanda. First Steps focuses on parents' support for physical, socio-emotional, cognitive and language development—with additional emphasis on the Rwandan priorities of avoiding family violence and cultivating foundational skills for emergent literacy in the home.

First Steps is offered through a series of weekly neighborhood-level meetings guided by radio programming and local facilitators, envisioning national expansion through merging with the Rwandan government's initiative *Umugoroba w'Ababyeyi* (Parents' Evening). The increased demand for emergent literacy materials created by First Steps is matched by a collaboration with local publishers, focused on publication of greater numbers of quality Kinyarwanda-language babies' and children's pre-literacy materials and books, and on encouraging the emergence of a new kind of entrepreneur operating book stalls on local market days.

This pilot phase of First Steps is focused on determining the most feasible and cost-effective approach to delivering parenting education, suitable for national expansion in the Rwandan context and effective in achieving improvements in parenting practices, child development indicators and emergent literacy promotion in the home. There are two approaches of interventions: one intervention group will receive a full package of parenting education plus at-home support, and the other will receive parenting education program without home visits.

There are four program components that will be tested through this First Steps project: (1) radio programming to facilitate parent group sessions; (2) a package of materials including a facilitators' guide, illustrated activity cards on parenting practices, two children's books per family, and a demonstration of home book-making using local supplies; (3) a trained area facilitator who can provide support to local volunteers in leading parenting sessions and conducting home visits; and (4) interventions to increase the availability of books and supplementary learning materials. A randomized controlled trial with groups exposed to different combinations of these components will help to determine the most effective modality.

The key research questions to be explored in this report include:

1. What are the baseline characteristics of families and children in the intervention groups?
2. How comparable are children and parents in the intervention and control groups at baseline in terms of family characteristics, home learning environments, health and developmental levels?

### **1.1 Context**

The target population for First Steps is ultimately the entire population of expectant parents and parents with children aged 0-3 in Rwanda. Rwanda ranks in the "low human development" category internationally, as number 151 out of 187 countries in the world, according to the UN's 2014 Human

Development Report—with the World Bank reporting 44.9% of the population at or below the national poverty line. First Steps will be piloted in the District of Ngororero, located in the Western Province of Rwanda. Ngororero is ranked the 9<sup>th</sup> poorest out of 30 districts, with 22.4% of its population classified as poor and 29.5% as extreme poor (NIS, 2012). In comparison to the national average, Ngororero's population has more difficult access to primary schools and health centers; Ngororero is also the fifth lowest district in terms of literacy rates, at only 63.8% among the population aged 15 and above. This low-literacy context means that many parents feel ill-equipped to promote their children's cognitive development—hence the need for First Steps to teach all parents how they can promote language development and emergent literacy at home through two-way talk, singing and storytelling, and exposing their children to a print-rich environment. Because First Steps envisions national expansion, the pilot phase will target residents from a range of socio-economic backgrounds in Ngororero District, rather than just the poorest; however, the overall development context demonstrates that the majority of beneficiaries of First Steps are disadvantaged in terms of poverty levels, education, health, and child development outcomes.

At its core, First Steps is a social innovation that transforms the Rwandan government's nascent Parents' Evening initiative into structured peer learning groups guided systematically through four sets of parenting topics: child development milestones; building positive relationships; creating an enabling environment for physical and socio-emotional health; and promoting emergent literacy in the home. This content is offered to parents' groups through a highly-accessible and cost-effective technology in the Rwandan context—weekly participatory radio programming. Finally, First Steps includes a business innovation to bolster the focus on emergent literacy, by supporting improvements in the supply side capacities of the local publishing industry. In addition to promoting community libraries, First Steps leverages Save the Children Rwanda's existing collaborations with the local publishing sector to encourage publishers to (1) develop a line of high-quality, age appropriate local language babies' and children's books (virtually non-existent, prior to Save the Children's efforts in this area); and (2) offer local market-stall operators a low-risk "sale-or-return" arrangement to encourage them to sell books in areas where there has traditionally been low demand.

## **1.2 Implementation Plan**

A preparatory phase for First Steps began with Save the Children Rwanda's existing project funding, and ended in April of 2015. This phase included the development of the content for eighteen weekly parenting education sessions, preparation of the draft evaluation tools for measuring parenting practices and child development indicators, and the trial of these two elements with 500 families. This preparatory phase also included initial discussions with MIGEPROF (Ministry of Gender and Family Promotion), and ongoing work with local publishers on creating a line of babies' and children's books in Kinyarwanda.

From May – August of 2015, the First Steps radio programming was created using the finalized session content. At the same time, collaborations with local publishers continued in order to finalize an initial set of Kinyarwanda babies' and children's books and educational posters in a range of quality and pricing options, and develop a credit-based "sale-or-return" system for incentivizing local bookseller entrepreneurs.

From November 2015 to January 2016, the randomized control trial (RCT) is being conducted with Cohort 1: 540 families in each of two different treatment conditions, plus a control group. Proof of concept will be established using a randomized controlled trial with Cohort 1. The three trial conditions are: (1) two half-day trainings for a local volunteer, a basic package of materials and parenting education sessions facilitated by radio; (2) the above, plus provision of a larger package of materials and an additional training for the volunteer on how to use them; plus a salaried area facilitator supporting the local volunteers in guiding group sessions and conducting home visits; (3) Control group receiving no parenting education support. It should be noted that all three groups will benefit from the same collaboration with local book publishers and booksellers.

In February 2016, there will be an initial evaluation of parenting practices and in the final phase of the First Steps pilot, from February-September 2016, the initial evaluation findings will be analysed to identify the likely preferred delivery mechanism for the program. This preferred approach will be adapted based on the Cohort 1 experiences, and then will be implemented with a smaller Cohort 2: 540 families from 27 of the villages that were not selected for the RCT. The processes of raising local authorities' awareness, training local volunteers, and conducting the parents' meetings, will be filmed for distribution during later scale-up efforts. Finally, an end-line evaluation of parenting practices and child development indicators among participants in Cohort 1 will be conducted in order to determine lasting program effects one year after the baseline, and in order to refine the model for the next level of scaled-up implementation.

## **II. Methods**

### **2.1 Tools**

Child development will be measured through a Kinyarwanda-adaptation of the *Ages & Stages Questionnaires<sup>TM</sup>* (ASQ), with additional questions introduced to measure parents' perception of children's physical development. A parenting practices survey based on the Home Observation Measurement of the Environment-Short Form (HOME-SF), adapted for the Rwandan context, will focus on key practices in the areas of nutrition and hygiene, nurturing and discipline, and the home learning environment. Demand for children's books will be measured according to the annual turnover of local booksellers.

### **2.2 Sampling**

The study population for this RCT was all children ages 6 to 24 months in the Ngororero District of Rwanda. Due to contamination concerns, randomization began with stratification at the sector level within Ngororero and 9 of the 13 sectors were included (Matyazo was excluded because it has no market at which to sell books and Ngororero, Muhororo and Hindiro were excluded because a similar intervention called First Read is being implemented there). The remaining 9 sectors were randomized into the three study arms; within each sector three cells were randomly chosen and then three villages within those cells were randomly selected. Finally 20 families with eligible children from each village were chosen (1,620 children in total). In order to select families, all parents who had a child aged 6 – 24 months were invited to a Parents' Evening session and asked to participate in the study. If more than 20

families attended the Parents' Evening session, the additional families were put on the waiting list for Cohort 2 implementation. Table 1 displays the final study sample by intervention group, age and child's gender.

Table 1. Sample distribution by group and age

Age (months)	Control (N=548)		Light touch <sup>1</sup> (N=540)		Full intervention <sup>2</sup> (N=526)		Total
	Boys	Girls	Boys	Girls	Boys	Girls	
6	13	14	12	11	12	12	74
7	16	25	15	13	17	13	99
8	6	12	13	12	19	16	78
9	16	17	19	15	9	10	86
10	18	14	10	14	19	15	90
11	16	26	17	17	14	24	114
12	15	14	10	18	7	21	85
13	11	11	17	13	25	9	86
14	15	23	10	12	21	24	105
15	14	19	20	14	15	21	103
16	13	19	10	17	12	12	83
17	10	16	11	14	10	13	74
18	13	13	17	21	19	15	98
19	13	11	19	21	18	15	97
20	14	19	13	21	5	14	86
21	8	15	20	6	8	11	68
22	8	15	12	10	6	9	60
23	12	17	16	10	10	11	76
24	10	7	9	11	7	8	52
<b>Total</b>	<b>241</b>	<b>307</b>	<b>270</b>	<b>270</b>	<b>253</b>	<b>273</b>	<b>1614</b>

### 2.3 Data collection

In order to collect the data, 30 assessors (graduates in sociology and social sciences mainly from University of Rwanda) were recruited and grouped into teams. Each team was composed of five assessors and one team leader. Assessors participated in an intensive seven-day training where they were trained in research ethics (including principles of ethical research, consent and assent processes), child safeguarding and how to put children at ease as best as possible to collect the most reliable data. Training sessions involved an explanation of assessment tools, practicing

<sup>1</sup> Light touch: Area of treatment condition with two half days training for a local volunteer, a basic package of materials and parenting education sessions facilitated by radio

<sup>2</sup> Full intervention: Area of treatment condition with the above, plus provision of a larger package of materials and an additional training for the volunteer on how to use them; plus a salaried area facilitator supporting the local volunteers in guiding group sessions and conducting home visits



assessment strategies using role-play and piloting of the tools in the field. Piloting in the field was followed by debrief meeting session and relevant adjustments were made to the tools. All instruments were digitized using Tangerine, a data collection software developed by Research Triangle Institute (RTI). Collection of data with this software on Samsung tablets is more efficient and effective compared to paper and pencil tools as it saves time and the costs involved in data entry. Data were uploaded on a daily basis and ultimately downloaded in .csv format for analysis.

## 2.4 Analysis

The main purpose of this analysis is investigating the status quo of parenting and child development in Ngororero District, Rwanda. In addition, significant differences between study groups are investigated, along with the possibility of any previous exposure to similar interventions. Summary statistics are presented to display average scores on parent and child dimensions for each study group.

ANOVA tests with Tukey-Kramer post-hoc adjustments were used to determine statistical significance of any differences between children and parents in the intervention and control groups. In addition, multivariate regression models were used to explore relationships between children’s development and their home environments.

## III. Results - Parents and home environment

This section will detail parent characteristics and home environments in this study, including background information about parents, program participation, knowledge of positive parenting behaviors, attitudes about parenting, and behaviors with children.

### 3.1 Background characteristics

On average at baseline mothers in this study were 29 years old and fathers were 36 years old. Households had an average of three children, with 90 percent of households reporting that only one of those children was under 3 years old. The majority of mothers and fathers reported their occupation as farmer and the average combined monthly family income was 19,021 Rwandan francs (RWF). Mothers and fathers in the Light touch intervention group had significantly higher education than mothers and fathers in the control and full intervention groups. Other than this, no significant differences were found between the groups.

Table 2. Baseline family characteristics, by group

	Control (N=548)	Light touch (N=540)	Full intervention (N=526)
<b>Mother age</b>	29.2	29.8	29.6
<b>Father age</b>	35.3	37.1	36.4
<b>Mother education</b>	1.5	1.7	1.5
<b>Father education</b>	1.5	1.7	1.6
<b># children at home</b>	3.0	2.7	3.0
<b>Monthly family income (RWF)</b>	16,878.4	19,886.4	20,420.1

### 3.2 Parent health knowledge and child feeding behaviors

This section describes various aspects of parents' health knowledge and behavior, including where they hear health information, their child feeding activities and hand washing habits. Parents report receiving health information from a few different sources, but most often reported hearing health advice from health workers.

Table 3. Sources of information about how to care for and feed young children

	Control (N=548)	Light touch (N=540)	Full intervention (N=526)
<b>NGO</b>	0%	0%	0%
<b>Parenting session</b>	2%	2%	1%
<b>Radio</b>	7%	5%	5%
<b>Television</b>	0%	0%	0%
<b>Newspaper</b>	0%	1%	0%
<b>Poster</b>	0%	0%	0%
<b>Friends</b>	5%	4%	7%
<b>Family members</b>	5%	4%	8%
<b>Health workers</b>	27%	43%	51%
<b>Nutrition program</b>	2%	5%	4%
<b>Internet</b>	0%	0%	0%
<b>Other</b>	4%	6%	4%

The majority of parents reported that their child had received a vitamin A drop, but significantly more parents in the light touch group reported this compared to parents in the control group (99 v. 95 percent). Almost all parents report currently breastfeeding their children. On average, parents report giving their child between two and three types of solid food in a day, but parents from both of the light and full intervention groups reported providing solid food more often than parents in the control group.

Table 4. Health and feeding activities

	Control (N=548)	Light touch (N=540)	Full intervention (N=526)
<b>Vitamin A drop</b>	95%	99%	97%
<b>Have ever breast fed child</b>	98%	98%	99%
<b>Currently breast feeding</b>	95%	95%	94%
<b># times child has solid food per day</b>	2.3	2.6	2.5

Most parents report washing their hands most frequently before eating followed by before feeding children and after eating. The least common time for parents to wash their hands was after cleaning the home or before cooking. Overall, parents in the light touch and full intervention groups reported more

handwashing activities than parents in the control group. Finally, 77 percent of parents report using soap and water when washing their hands, with full intervention parents significantly less likely to use soap than parents in the light touch group.

Table 5. Frequency of hand washing

	<b>Control (N=548)</b>	<b>Light touch (N=540)</b>	<b>Full intervention (N=526)</b>
<b>Before eating</b>	84%	87%	88%
<b>Before cooking</b>	38%	39%	40%
<b>Before feeding children</b>	48%	64%	63%
<b>After toilet</b>	43%	53%	54%
<b>After cleaning child's bottom</b>	35%	43%	46%
<b>After eating</b>	47%	54%	63%
<b>After cleaning home</b>	22%	27%	28%
<b># hand washing activities</b>	3.3	3.8	3.9
<b>Uses soap and water to wash hands</b>	76%	81%	74%

### 3.3 Parent attitudes and behaviors

This section includes information about parents' attitudes and behaviors with their children. Parents were asked how much influence they felt that they had on various aspects of their children's lives, 0 meaning "No influence" and 3 meaning "A lot of influence". On average, parents felt they had "Much influence" (value of 2) on their children's development and there was not a significant difference in parents' perception of their influence on their children between study groups.

Table 6. Parents' attitudes about their influence on their child

	<b>Control (N=548)</b>	<b>Light touch (N=540)</b>	<b>Full intervention (N=526)</b>
<b>Learning</b>	1.8	1.8	1.8
<b>Development</b>	1.8	1.9	1.9
<b>Nutrition</b>	1.9	1.9	1.9
<b>Care</b>	1.7	1.8	1.8
<b>Discipline</b>	1.7	1.8	1.8
<b>Health</b>	1.6	1.8	1.7
<b>Total influence (0-18)</b>	10.6	11.1	10.7

Mothers and fathers were also asked about the frequency with which they engage in different activities with their children, with 0 meaning "Not at all" and 5 meaning "More than once per day". There is a range in the frequency of different activities but the most frequent activities are taking children to see relatives, taking children to play outside, soothing children and criticizing or shouting at children. The least frequent activities are reading books, showing pictures books to children and playing inside with

toys. There were no significant differences between the frequencies of engaging in these activities with children between groups.

Table 7. Frequency of mothers' and fathers' activities with children

	Control (N=548)		Light touch (N=540)		Full intervention (N=526)	
	Mother	Father	Mother	Father	Mother	Father
<b>Play</b>	2.1	2.2	2.2	1.9	2.0	2.1
<b>Sing</b>	1.9	1.8	2.0	1.6	2.0	1.6
<b>Read books</b>	0.6	0.7	0.7	0.7	0.4	0.5
<b>Tell stories</b>	1.2	1.1	1.2	1.1	1.1	1.1
<b>Play inside with toys</b>	1.4	1.2	1.4	1.3	1.3	1.2
<b>Take child outside to play</b>	2.5	2.0	2.4	1.6	2.3	1.8
<b>Show picture books/magazines</b>	0.8	0.8	0.8	0.8	0.6	0.6
<b>Take to visit relatives</b>	3.1	2.1	3.2	1.8	3.2	2.1
<b>Show something new</b>	2.2	1.9	2.2	1.9	2.2	2.0
<b>Hug/kiss</b>	2.1	2.1	2.1	2.0	2.0	2.3
<b>Soothe</b>	2.1	2.3	2.2	2.1	2.1	2.4
<b>Respond verbally to child's questions</b>	1.9	1.8	2.0	1.9	2.2	2.1
<b>Praise child</b>	2.1	2.0	2.1	1.9	2.0	2.1
<b>Name objects</b>	1.9	1.8	2.1	1.8	2.0	1.9
<b>Count or sort objects</b>	1.4	1.0	1.6	1.3	1.5	1.1
<b>Guide or give positive discipline</b>	2.2	2.2	2.4	1.9	2.4	2.3
<b>Total positive activities</b>	<b>29.5</b>	<b>31.0</b>	<b>30.4</b>	<b>29.4</b>	<b>29.3</b>	<b>30.9</b>
<b>Criticize/shout</b>	2.3	2.3	2.6	2.2	2.5	2.3
<b>Threaten/hit/push/spank</b>	1.9	1.7	2.2	1.6	1.8	1.4

Figure 1. Proportion of mother's engaging in early learning activities with their children

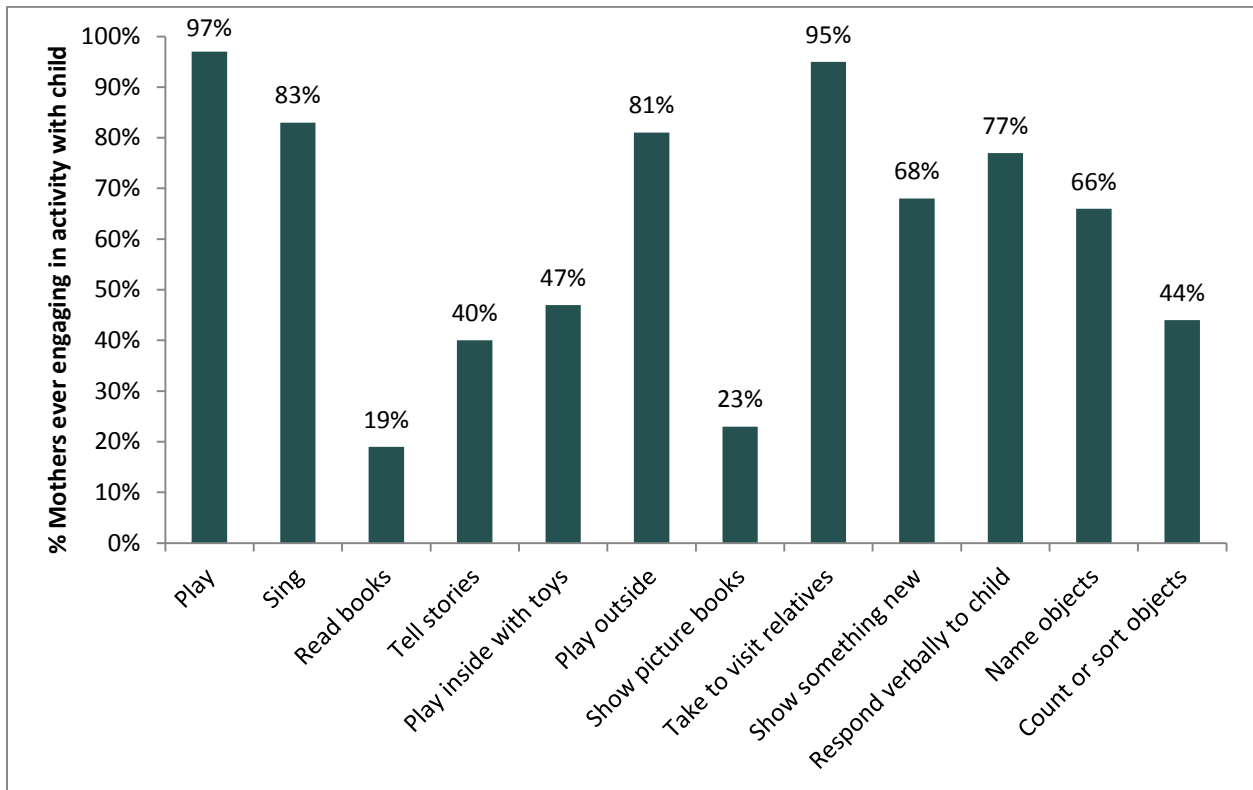
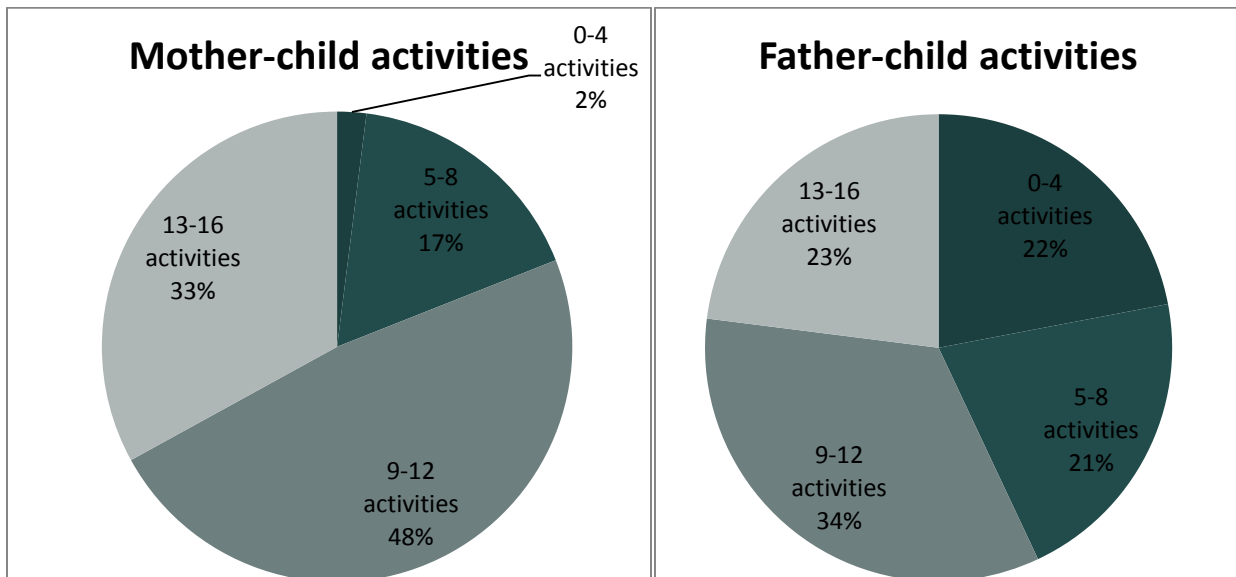


Figure 2a & 2b. Number of positive mother-child and father-child activities



Fathers were also specifically asked about their caretaking behaviors with children. On average, fathers felt somewhat involved in caring for their child and reported spending an average of 37 minutes per day caring for their children. Almost all fathers reported caring for their child while their wife was busy with

housework and 69 percent report taking their child on outings. There were no significant differences between father-reported childcare between groups. However, it should be noted that the total number of fathers responding to these questions was quite low (101 out of 1612 families).

Table 8. Father reported child care

	Control (N=41)	Light touch (N=41)	Full intervention (N=19)
<b>Involved in caring for child (1=Rarely involved, 4=Very involved)</b>	2.0	2.1	1.8
<b>Minutes spent caring for child</b>	26.8	47.4	36.6
<b>Care for child while mother is busy with housework (Yes/No)</b>	91%	93%	93%
<b>Take child on outings (Yes/No)</b>	64%	78%	62%

#### IV. Exposure to previous interventions

Parents were also asked whether they had been exposed to previous parenting interventions. Specifically, parents were asked whether they had attended a parenting session, received a home visit from a parenting facilitator, heard messages about children on the radio or participated in community structure meetings. On average across study groups, 7 percent of parents report having attended a parenting session in the past year, 3 percent have received a home visit and 14 percent have heard a radio program about children. The most popular radio station was Radio Rwanda by far.

The only significant difference in exposure to previous programs was that parents in the full intervention group were more likely to have participated in a community structure meeting than parents in the other groups. Participation in community structure meetings was investigated further and no significant differences were found between the development of children whose parents attended these sessions and those who did not. In general the exposure to previous interventions appears to be low and even across study groups, suggesting that it will not substantially impact the results of this study.

Table 9. Exposure to previous parenting interventions

	Control (N=548)	Light touch (N=540)	Full intervention (N=526)
<b>Attended parenting sessions in past 12 months</b>	6%	6%	8%
<b># of sessions attended</b>	2.8	3.3	3.0
<b>Received home visiting in past 12 months</b>	4%	3%	2%
<b># home visits</b>	1.7	2.1	1.8
<b>Heard radio program about children in past 5 months</b>	13%	14%	14%
<b># radio sessions heard</b>	3.8	4.1	6.8
<b>Participated in community structure "Umugoroba w'ababyeyi</b>	7%	4%	12%

## V. Results - Ages and Stages Questionnaire (ASQ)

The section will describe baseline results of the Ages and Stages Questionnaire (ASQ) by study group and age. Overall, children had the strongest skills in the area of gross motor development and the weakest in problem solving. Children in the light touch group had significantly stronger skills than children in the control group in fine motor, problem solving and personal-social development. Children in the full intervention group had significantly stronger skills than children in the control group in fine motor development. There were no significant differences between the skills of children in the light and full intervention groups.

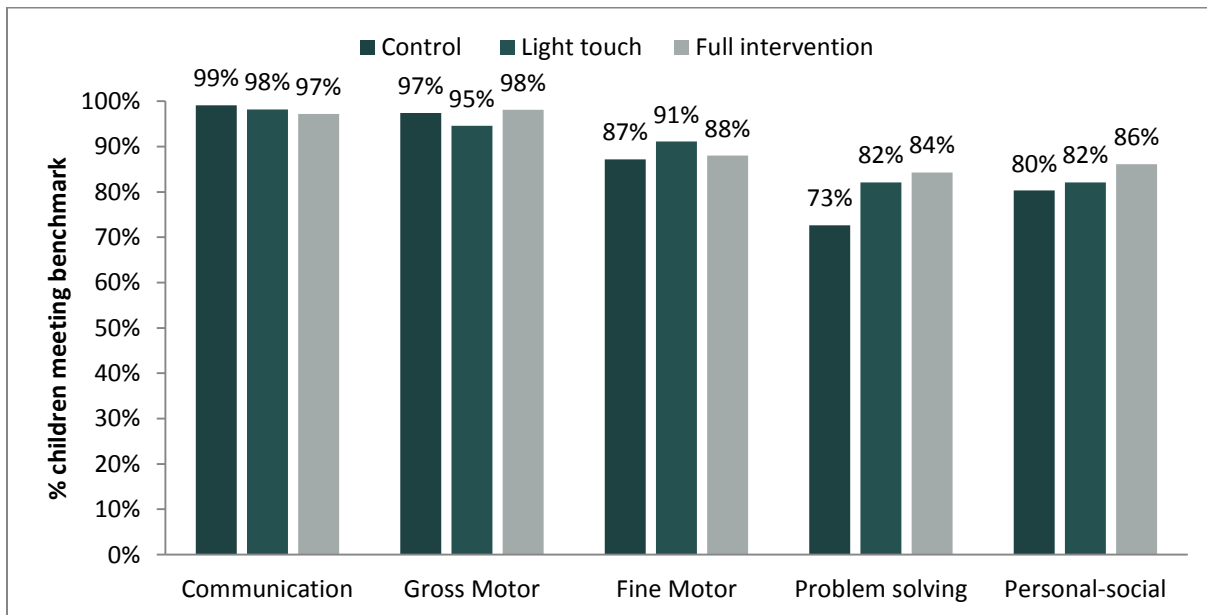
Table 10. Proportion of children meeting ASQ benchmarks, all children

	Control (N=548)	Light touch (N=540)	Full intervention (N=526)
<b>Communication</b>	78%	79%	81%
<b>Gross Motor</b>	80%	85%	84%
<b>Fine Motor</b>	62%	74%	73%
<b>Problem solving</b>	58%	69%	64%
<b>Personal-social</b>	77%	84%	84%

### 5.1 Age 6-9 Months

Children aged 6-9 months were given the 6-month ASQ assessment to investigate baseline development. Overall, most children are reaching the established 6-month ASQ benchmark. Children have the strongest skills in the area of communication and the weakest in problem solving. There are no significant differences between children's development across groups.

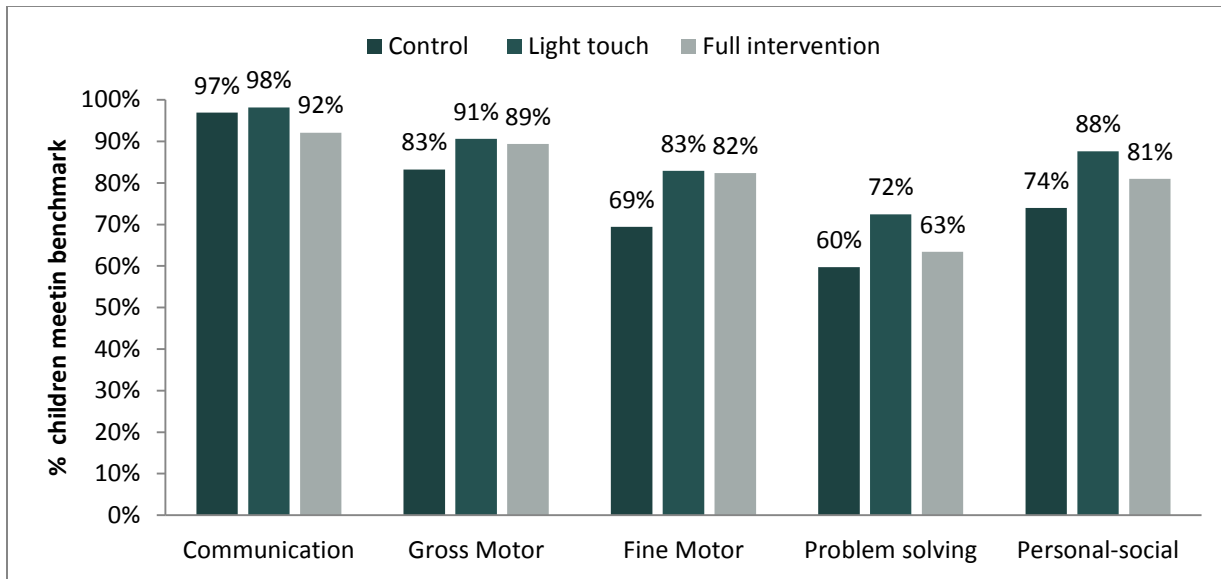
Figure 3. Proportion of children meeting 6-month ASQ benchmark



## 5.2 Age 10-15 Months

Children aged 10-15 months were given the 12-month ASQ assessment. Children showed the strongest skills in communication and the weakest in problem solving. Children in the control group displayed significantly weaker fine motor skills than children in the full and intervention groups, and weaker than the light touch group in problem solving, personal-social and gross motors skills. Also, children in the full intervention group scored significantly lower than children in the light touch group in communication.

Figure 4. Proportion of children meeting 12-month ASQ benchmark

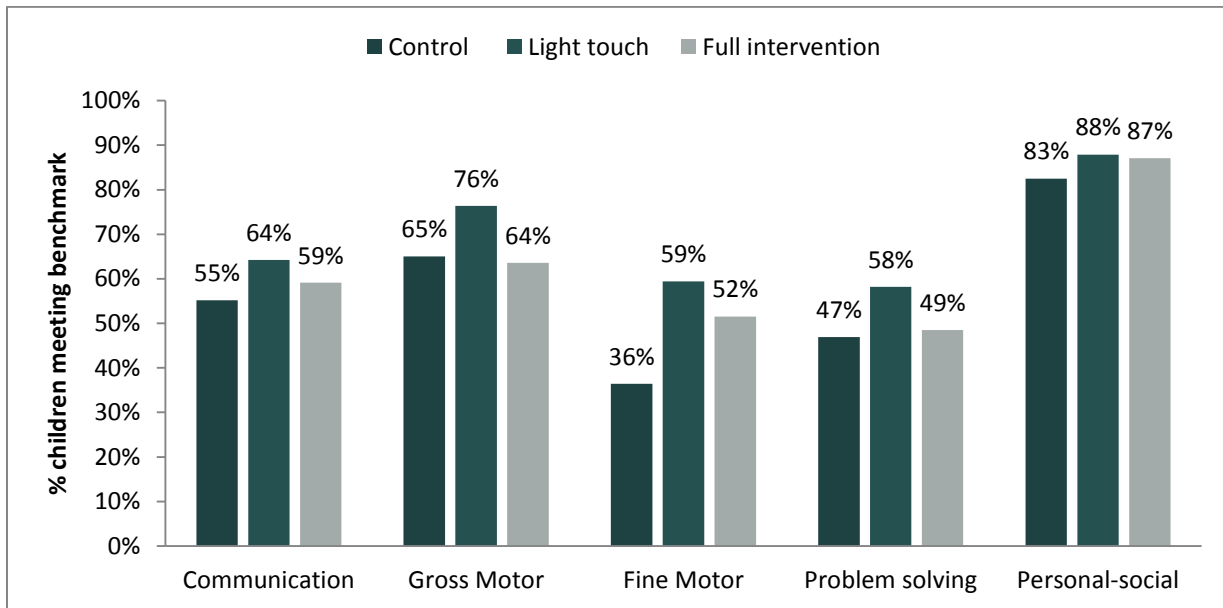


## 5.3 Age 16-20 Months

Children aged 16-20 months were given the 18-month ASQ assessment. At this stage children had the strongest skills in the area of personal-social development and the weakest in problem solving. Children in the light touch group showed significantly stronger skills than children in the control and full intervention groups in their gross motor development and stronger skills than the control group only in fine motor skills.



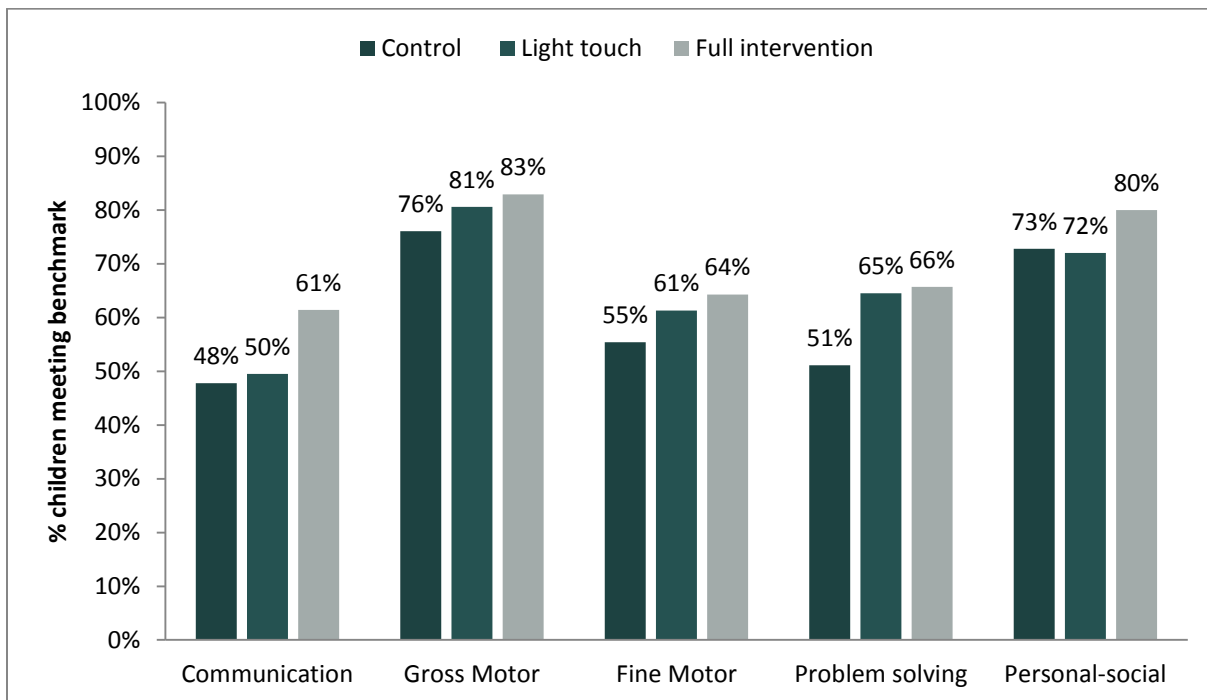
Figure 5. Proportion of children meeting 18-month ASQ benchmark



### 5.4 Age 21-24 Months

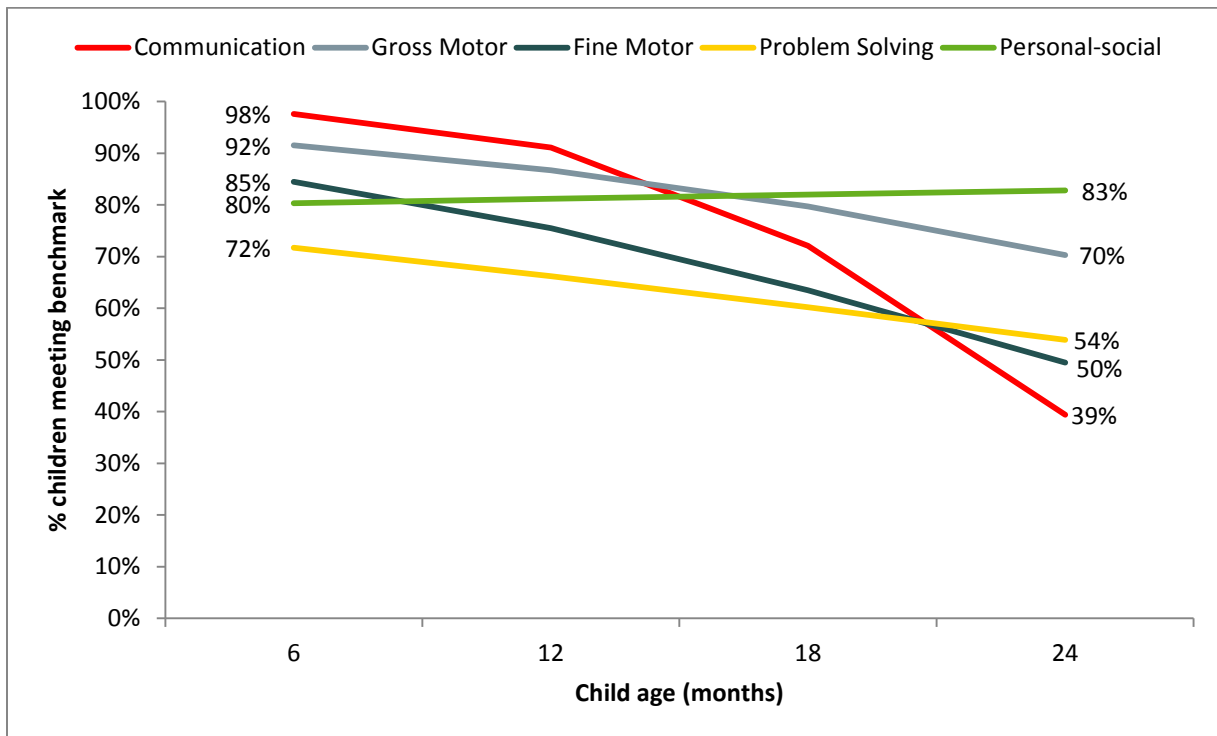
Children aged 21-24 months were given the 24-month ASQ assessment. They displayed the strongest skills in the area of gross motor development and the weakest in communication. There were no significant differences between children’s scores across groups.

Figure 6. Proportion of children meeting 24-month ASQ benchmark



With the exception of personal-social skills, older children were less likely to meet ASQ benchmarks than younger children. Due to the varied age ranges used for the ASQ assessments, it could be the case that children in the oldest age group were less likely to meet the ASQ benchmark because the age range used included children who were less than 24 months (21-24 months), compared to the group of children aged 6-9 months who were given the 6-month ASQ tool. However, when looking only at children who took the assessment at the correctly specified age, the trend remains consistent. The steepest decline in skills is in communication.

Figure 7. Proportion of all children meeting ASQ benchmarks, by age



## 5.6 Parent perceptions about child development

Parents were also asked about whether they had specific concerns regarding their children's development. In general for children aged 6-15 months, most parents report that their children were using both hands equally well and their feet were flat when the child tried to stand. Very few parents had concerns about their children's behavior, that their children were too quiet or that they had vision problems.

Table 10. Parent concerns about child development, 6-15 months

	6-9 months			10-15 months		
	Control	Light touch	Full intervention	Control	Light touch	Full intervention
<b>Baby uses both hands and legs equally well</b>	88%	96%	96%	93%	98%	97%
<b>When baby stands his feet are flat on the surface most of the time</b>	77%	86%	86%	89%	98%	95%
<b>Parent as concerns that their baby is too quiet</b>	2%	3%	2%	6%	2%	3%
<b>At least one parent has a family history of early deafness</b>	10%	4%	10%	7%	7%	6%
<b>Parent has concerns about their baby's vision</b>	9%	9%	4%	9%	11%	9%
<b>Baby has had medical problems in the past few months</b>	45%	48%	44%	61%	45%	48%
<b>Parent has concerns about their baby's behavior</b>	3%	5%	3%	6%	2%	2%
<b>Something about baby worries parent</b>	26%	38%	24%	44%	29%	32%
<b>Baby plays with sounds or seems to make words</b>	NA	NA	NA	89%	96%	95%

In general for children aged 16-24 months, most parents report that their children hearing, talking and walking/running well. Very few parents had concerns about their children's behavior, except than about half of parents reported that their child had had medical problems in the past few months.

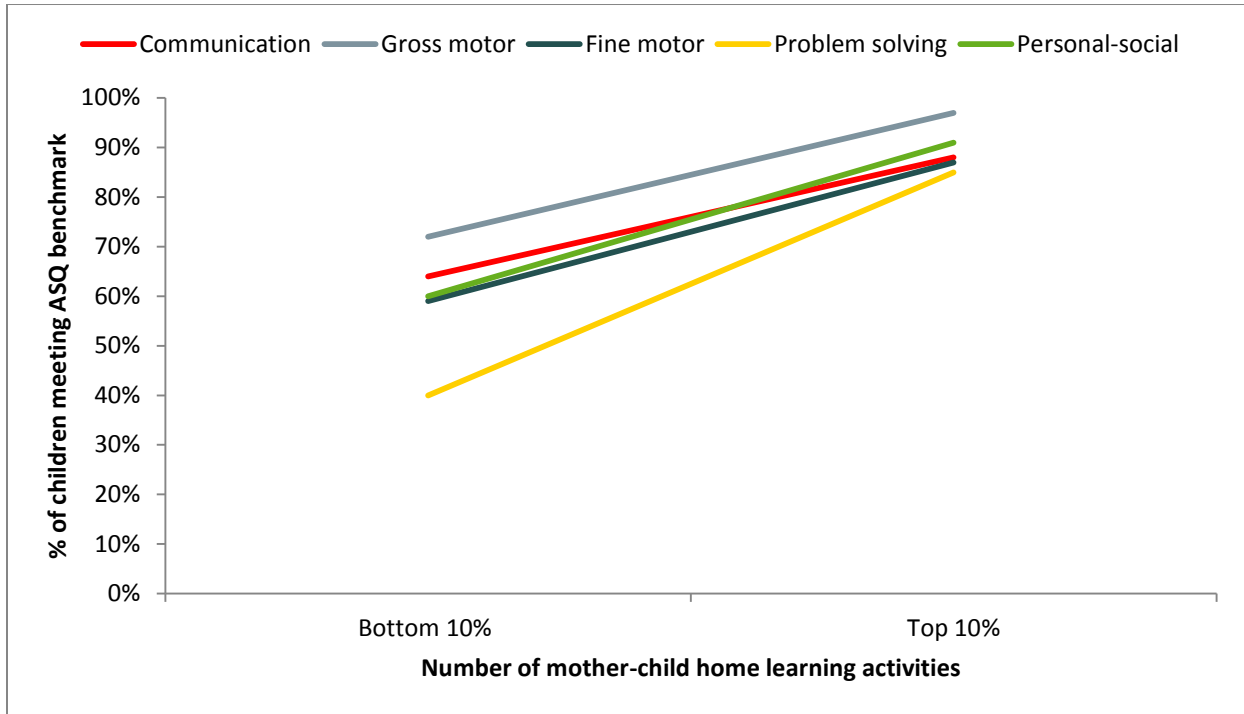
Table 11. Parent concerns about child development, 16-24 months

	16-20 months			21-24 months		
	Control	Light touch	Full intervention	Control	Light touch	Full intervention
<b>Child hears well</b>	99%	98%	98%	97%	99%	100%
<b>Child talks like other toddlers the same age</b>	92%	91%	95%	90%	91%	93%
<b>Parent can you understand most of what their child says</b>	83%	81%	80%	86%	84%	89%
<b>Child walks, runs, and climbs like other toddlers the same age</b>	91%	95%	91%	91%	97%	93%
<b>At least one parent has a family history of early deafness</b>	10%	7%	14%	15%	4%	6%
<b>Parent has concerns about their baby's vision</b>	12%	10%	9%	12%	10%	11%
<b>Baby has had medical problems in the past few months</b>	57%	47%	48%	59%	51%	46%
<b>Parent has concerns about their baby's behavior</b>	9%	5%	5%	15%	4%	4%
<b>Something about baby worries parent</b>	37%	38%	22%	39%	40%	30%

## VI. Multivariate modeling

Multivariate regressions were used to investigate significant predictors of children’s development before any intervention has started. This is in an attempt to understand what factors most influence children’s early development. Across the study groups, the most pronounced finding was that children with parents who reported engaging in more play and stimulation activities were more likely to meet the ASQ benchmark for their age than children with parents who engaged with them less frequently (see Figure 8). In addition, analyses found that children from wealthier households were more likely to meet the ASQ benchmark for their age group than children from poorer families in three of the five domains. Mother’s education was positively related to children meeting the fine motor benchmark and mother’s age was negatively related to children meeting the personal-social benchmark. There were no differences between the likelihood of boys or girls to meet any of the ASQ benchmarks.

Figure 8. Proportion of children meeting ASQ benchmark by frequency of home learning activities with mother



Note: Figure controls for children’s age, sex, home possessions and study group

Parents’ report of their children’s development was also found to have some relationships with early development. For instance, for parents of children age 6-15 months, who reported concerns that their child was too quiet, there was a strong negative relationship with meeting ASQ benchmarks. In addition, children aged 10-15 months whose parents reported being worried about their behavior were also less likely to meet all ASQ benchmarks, controlling for other relevant background characteristics (child age, sex, home possessions, home learning activities and study group). Children of parents who reported that they understood most of what their child said were significantly more likely to meet all ASQ benchmarks for children aged 16-24 months.

## VII. Conclusion

Results of this baseline study provided robust information about the family characteristics and child development of families in this study. Regarding health, analyses find that the majority of parents reported that their child had received a vitamin A drop, but significantly more parents in the light touch group reported this compared to parents in the control group. Additionally, most parents reported currently breastfeeding their children and giving their child between two and three types of solid food in a day. Parents from both of the light and full intervention groups reported providing solid food more often than parents in the control group.

Parents reported washing their hands most frequently before eating, followed by before feeding children and after eating. The least common time for parents to wash their hands was after cleaning the home or before cooking. Overall, parents in the light touch and full intervention groups reported more handwashing activities than parents in the control group. Seventy-seven percent of parents report using soap and water when washing their hands, with full intervention parents significantly less likely to use soap than parents in the light touch group.

Mothers and fathers were asked about the frequency with which they engage in different activities with their children and the most frequent are taking children to see relatives, taking the child to play outside, soothing children and criticizing or shouting at children. The least frequent are reading books, showing pictures books to child and playing inside with toys. Mothers reported engaging in more activities with children than fathers, and there were no significant differences between the frequencies of engaging in these activities with children between groups.

Parents were also asked whether they had been exposed to previous parenting interventions. Specifically, parents were asked whether they had attended a parenting session, received a home visit from a parenting facilitator, heard messages about children on the radio or participated in community structure meetings. On average, 7 percent of parents reported having attended a parenting session in the past year, 3 percent have received a home visit and 14 percent have heard a radio program about children. The most popular radio station by far was Radio Rwanda.

The only significant difference in exposure to previous programs was that parents in the full intervention group were more likely to have participated in a community structure meeting than parents in the other groups. Participation in community structure meetings was investigated further and no significant differences were found between the development of children whose parents attended these sessions and those who did not. In general the exposure to previous interventions appears to be low and even across study groups, suggesting that it will not substantially impact the results of this study.

Overall, children had the strongest skills in the area of gross motor development and the weakest in problem solving. Children in the light touch group had significantly stronger skills than children in the control group in fine motor, problem solving and personal-social development. Children in the full intervention group had significantly stronger skills than children in the control group in fine motor development. There were no significant differences between the skills of children in the light and full intervention groups. These baseline skills differences between intervention groups and the control group suggest that baseline skill levels should be controlled for during follow-up data collections in order to help account for these differences when assessing changes in child development.

Looking at trends in child development outcomes, analyses find that older children were less likely to meet ASQ benchmarks than younger children, and the steepest decline in skills was in the area of communication. In addition, using multivariate regressions to investigate predictors for children's early development, the most pronounced finding was that children with parents who reported engaging in more play and stimulation activities were more likely to meet the ASQ benchmark for their age than children whose parents engaged with them less frequently. In addition, analyses found that children

from wealthier households were more likely to meet the ASQ benchmark for their age group than children from poorer families in three of the five domains.

Findings from this baseline study confirm the importance of the First Steps program in Ngororero. Notably, of all activities that parents reported engaging in with their children, the least common were activities related to early learning and literacy. In fact, while 97 percent of mothers report playing with their children only 40 percent of mothers report ever telling stories to their children and 23 percent report ever showing them picture books. Further, the decline in older children's likelihood of meeting developmental milestones, especially with their communication skills, highlights the importance of helping parents better support their children's early language development. Therefore, data from the baseline study clearly display that the First Steps program's focus on raising parents' awareness of the importance of engaging verbally with their children, teaching them effective techniques for doing so, and providing greater access to child-friendly print materials are well suited to the needs of young children and their families in the intervention area.

## VIII. Appendix A

Table A1. Multivariate logistic regression results, all children

VARIABLES	(1) Communication	(2) Gross motor	(3) Fine motor	(4) Problem solving	(5) Personal- social
Mother age		-0.0164 (0.0105)			-0.0265* (0.0121)
Mother education			0.205** (0.0749)		
Attended parenting session in past year				0.554* (0.258)	
Had home visit in the past year					1.458* (0.697)
Owns a radio or mobile phone	0.213* (0.0871)	0.184* (0.0893)		0.318*** (0.0604)	0.137 (0.0911)
# home learning activities (mother)	0.172*** (0.0279)	0.151*** (0.0279)	0.135*** (0.0215)	0.202*** (0.0282)	0.209*** (0.0289)
Child is female	0.261 (0.135)	-0.145 (0.143)	0.0937 (0.123)	-0.0124 (0.109)	0.174 (0.126)
Child age (months)	-0.262*** (0.0180)	-0.104*** (0.0130)	-0.121*** (0.0120)	-0.0789*** (0.0119)	-0.0137 (0.0135)
Study group	0.0194 (0.0897)	0.108 (0.102)	0.243* (0.0995)	0.116 (0.0873)	0.183 (0.104)
Constant	3.086*** (0.385)	1.914*** (0.528)	0.252 (0.354)	-1.021** (0.374)	-0.484 (0.556)
Observations	1,611	1,590	1,559	1,611	1,590

Robust standard errors in parentheses

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05