



African Population and  
Health Research Center

# Evaluation of the Feasibility and Effectiveness of a Health Facility-Based and Home-Based Early Childhood Development (ECD) Intervention in Siaya County, Kenya



**Final Baseline Report  
November, 2019**





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### African Population and Health Research Center

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## Abbreviations and Acronyms

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<b>ANC</b>	Antenatal Care
<b>APHRC</b>	African Population and Health Research Center
<b>CCD</b>	Care for Child Development
<b>CHV</b>	Community Health Volunteer
<b>ECD</b>	Early Childhood Development
<b>HF</b>	Health facility
<b>HIV</b>	Human Immunodeficiency Virus
<b>ICC</b>	Intra-cluster Correlation
<b>IDI</b>	In-depth Interview
<b>IMCI</b>	Integrated Management of Childhood Illness
<b>FGD</b>	Focus Group Discussion
<b>KAP</b>	Knowledge, Attitudes and Practices
<b>KII</b>	Key Informant Interview
<b>LMICs</b>	Low- and Middle-Income Countries
<b>MCH</b>	Maternal and Child Health
<b>MCW</b>	Maternal and Child Wellbeing
<b>MoH</b>	Ministry of Health
<b>NIS</b>	National Immunization Schedule
<b>RCT</b>	Randomized Controlled Trial
<b>SAT</b>	Strategic Advisory Team
<b>SSA</b>	Sub-Saharan Africa



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## Executive Summary

This report is derived from the baseline findings of an evaluation of the feasibility and effectiveness of integrating an early childhood development (ECD) intervention into the health system in Siaya County, Kenya. The evaluation is being conducted by the African Population and Health Research Center (APHRC) and is concerned with improvements in mother/caregiver ECD knowledge, attitudes and practices (KAP), as well as child growth and developmental outcomes. Furthermore, the study also estimates the costs and investigates the cost-effectiveness of the intervention from the provider's perspective.

Studies have shown that more than 250 million children in low- and middle-income countries (LMICs) are at risk of not reaching their developmental potential. The risks, which are exacerbated by poverty, are associated with poor health and nutrition, high prevalence of HIV and home environments with limited or no stimulation. One of the key recommendations from the 2016 Lancet Early Childhood Development Series is for routine maternal and child health (MCH) and nutrition services to expand their scope by integrating ECD content. Given that routine health and nutrition services are often the only means to consistently reach children and their caregivers in LMICs, PATH is working with the Ministry of Health (MoH) at the national level and in Siaya County to integrate ECD content into the health system services.

The intervention package is based on the training and mentoring of facility-based health service providers and community health volunteers (CHVs) on play and communication. At the facility, nurses are trained to integrate ECD counseling and screening along with light-touch nutrition counseling during immunization touch points. Mother/caregiver-child dyads are also exposed to playboxes during the health facility visits. In the home-based ECD intervention, mother/caregiver-child dyads receive home-based counseling on ECD by CHVs, who are trained to integrate this content into their routine home visits. PATH conducts the training and mentoring for facility-based service providers and CHVs to deliver the health facility-based ECD intervention and the home-based counseling, respectively. The evaluation, designed as a cluster-randomized controlled trial, is a three-armed study that utilizes both qualitative and quantitative methodologies. In the first arm, mother/caregiver-child dyads only receive the health facility-based ECD intervention that is integrated into the routine, facility-based MoH service touch-points. In the second, mother/caregiver-child dyads receive the health facility-based ECD intervention combined with the home-based ECD intervention that is integrated into routine CHV home visits.

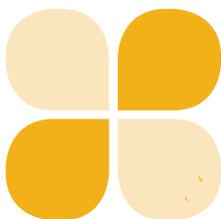
The third arm (control) receives the current standard care offered by the MoH. Eighteen health facilities were selected in Bondo sub-County and were randomly allocated to the three arms. Mothers/caregivers were consecutively recruited in their third trimester of pregnancy as they attended their antenatal care (ANC) sessions. A total of 792 pregnant women were recruited, distributed as follows across the three arms: 260 in the first arm, 261 in the second and 271 in the third arm.

For the qualitative study, participants were purposively recruited from the 18 health facilities. The evaluation included key informant interviews (KIIs) with six county government officials as well as 18 facility supervisors. We also conducted eight focus group discussions (FGDs) and 11 in-depth interviews (IDIs) with caregivers.

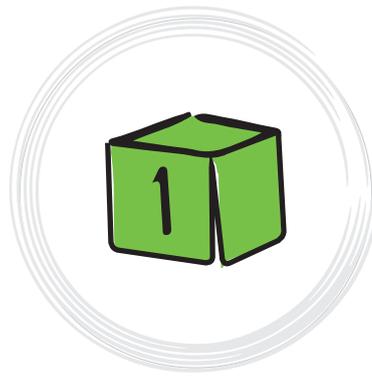
From the qualitative findings, participants perceived that children in the community were growing well, which was attributed to positive health-seeking behaviors by primary caregivers. Service provision was deemed to be good, and included immunization, nutritional supplementation, MCH, and antenatal care (ANC) services. The uptake of these services was reported to be good as a high percentage of caregivers go for skilled delivery and attend ANC clinics.

However, play and communication activities were not mentioned as regular activities in the facilities. Further, there are no policies that recommend the integration of ECD content into the health system. Despite some challenges and possible barriers such as lack of personnel and space, and low male participation, participants perceived the intervention as being key in addressing some of the developmental issues within the county. Health system stakeholders perceived the integration of ECD into the health systems as feasible and acceptable within the community. They undertook to provide the necessary support within the facility and at the community level for proper integration.

For the quantitative survey, the three arms generally shared similarities with regards to primary caregivers' demographic characteristics, as the differences seen were not statistically significant. These findings suggest that there is baseline balance in terms of education, occupation and average age of the primary caregivers. Similarities were also seen in relation to ANC uptake, breastfeeding knowledge, attitudes and practices (KAP) as well as responsive caregiving and caregivers' KAP and skills. We would therefore be able to attribute any changes seen in caregivers' KAP to exposure to the intervention.



**There is baseline balance in terms of education, occupation and average age of the primary caregivers. Similarities were also seen in relation to ANC uptake, breastfeeding knowledge, attitudes and practices (KAP) as well as responsive caregiving and caregivers' KAP and skills.**



# Chapter One

## Introduction

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This project report is based on the baseline data collection activities for the integrated early childhood development (ECD) intervention currently being conducted in Siaya County and evaluated by the African Population and Health Research Center (APHRC). The integrated ECD intervention is centered around an adapted and expanded Care for Child Development (CCD) module (1). The study, whose overall objective is to evaluate the feasibility and effectiveness of integrating ECD content into the health system, has been funded by the ELMA Philanthropies, with additional funding through a sub-grant from PATH (funded by the Conrad N. Hilton Foundation).

### 1.1 Background of the Study

The findings released by the 2016 Lancet Early Childhood Development Series estimated that approximately 250 million children aged less than five years in low- and middle-income countries (LMICs) are at risk of not reaching their developmental potential (2). The Lancet Series further estimated that 67% of these children live in sub-Saharan Africa (SSA). The risks are attributed to poor nutrition, poor health and high prevalence of HIV in the community, all of which are exacerbated by poverty. In addition, the home environments in which these children live have few opportunities for early stimulation, learning, and responsive caregiving. All these factors contribute to the risks and consequently adversely affect children's cognitive, physical, and social-emotional development. Responsive care and stimulation during the critical window of opportunity from conception to the first two or three years of a child's life are key ingredients for promoting optimal child growth and development, and can buffer the negative effects of living in disadvantaged settings (3). Children who are not adequately stimulated in their early years may not achieve their developmental potential in life and may experience lifelong disparities in health, academic achievement, and earning potential compared to children who grow up in an environment characterized by responsive care and stimulation (4).

Child survival has improved globally, with under-five mortality reduced by 53% between 1990 and 2015, owing to improved socioeconomic conditions, health systems and access to health services (5). Because more children are surviving, it is essential to ensure that they are given the best chance to reach their full potential in life (5). The period from conception to a child's second or third birthday represents the most critical time in a child's development. This is the period when the brain develops - and physically grows in size - most rapidly (3). Therefore, this period lays the foundation for physical, emotional, and intellectual well-being for the rest of a child's life. The plasticity of the child's brain during this period and their high degree of adaptability means that the greatest benefits from ECD interventions can be delivered during this period (7).

The main causes of poor child development include malnutrition, chronic poverty, and inadequate cognitive and social-emotional stimulation. Other potential risk factors include poor maternal education, harsh parenting, maternal depression, environmental pollution, and infectious diseases (8). Interventions aimed at enhancing caregiver-child relationships are therefore considered strategic in improving the survival, health, and development of a child (3). As outlined in the extended UNICEF care model (9), childcare behaviors including feeding and psychosocial stimulation are integral to the growth, development, and health of children. Such behaviors may be promoted through parenting interventions that enhance parent-child interactions, improve responsiveness in feeding and care for infants and young children, increase attachment, improve communication, encourage learning, and promote speech and language, positive discipline, and problem-solving skills (10). These parenting interventions may be delivered through home visits or community groups or may be integrated within the health system.

Integrating ECD interventions into routine health services has several advantages, including: excellent coverage and compliance with child health visits; averting additional staff costs as it can be implemented by existing staff; time optimization as it requires no additional time for parents at the clinic; and, no adverse effects on the nutrition or immunization status of the children (11). In many LMICs, the health system is often the only existing infrastructure that can consistently and regularly reach young children and as such, may be used to facilitate the delivery of ECD interventions (12). For instance, in a sequentially-conducted controlled trial in Turkey to determine the efficacy and safety of the Care for Development Intervention, delivery of the Care for Development messages during acute healthcare visits by trained physicians resulted in more optimal stimulation of young children by caregivers in the intervention group than their counterparts in the comparison group (13). A study exploring the integration of responsive stimulation into home visits delivered by community health workers in Pakistan (14) showed that responsive stimulation had significant benefits on early child cognition, language, and motor development.

A systematic review evaluating the effects of integrating child stimulation and nutrition intervention on child development and nutrition status (15) also revealed that stimulation consistently benefited child development. Chang and colleagues (11) developed a parent training package based on video modelling that could be integrated into routine primary healthcare visits. The results from their study demonstrated improvements in children's cognitive development and mothers' knowledge of child development. In another study, the feasibility of integrating child stimulation into primary care was tested among undernourished children in Jamaica (16). The intervention had significant benefits on child development, as well as on mothers' knowledge of child rearing, demonstrating that integrating parenting skills and early psychosocial stimulation for undernourished children into primary care was feasible and effective. These approaches are validated by the most recent Lancet Series on ECD, which calls for maternal and child health services to include ECD as a core component.

In SSA, the literature on the effectiveness of ECD interventions on changing caregivers' (KAPs) is sparse. Nonetheless, even though not specific to ECD, the findings from a study in South Africa demonstrated that, apart from improving the growth of the index child (child participating in the intervention), a home-based maternal and child health intervention delivered by community health volunteers (CHVs) had a significant effect on the growth of other children aged under six years and living within the same household (17). Another study concluded that a home stimulation program taught to the primary caregiver during clinic visits can significantly improve developmental outcomes in young children infected with HIV (18). However, as far as the literature has revealed, there are no studies reporting the effectiveness of interventions that integrate promotion of ECD and screening for developmental milestones into the health system in changing caregivers' KAP. Studies on the cost-effectiveness of ECD interventions in SSA are also scarce. Most studies have assessed the costs and benefits of preschool-based ECD interventions on school readiness, school achievement and performance among older children. Less attention has been given to establishing the cost-effectiveness of integrating ECD interventions targeting younger children into the health system. With the aid of a cluster-randomized control trial on children aged 0 to 24 months, a study in rural Pakistan (19) compared the effectiveness and costs of integrating three ECD interventions – responsive stimulation, enhanced nutrition and the combination of both – into an existing community-based health service. Without providing any robust criteria for choosing the most effective program, the authors suggested that the most cost-effective one was the integrated intervention. The current study therefore fills the gap of a dearth of evidence in SSA by providing information to policymakers on the effectiveness, feasibility, cost, and cost-effectiveness of integrating ECD interventions into the healthcare system.

## 1.2 The ECD Intervention

The ECD intervention is implemented by the Department of Health in Siaya County and is supported by PATH. This is in line with the recommendations made in the 2016 Lancet Series that routine maternal and child health and nutrition services should expand their scope by integrating ECD content. Broadly, PATH's integrated ECD model in Siaya has the following components: 1) Integration of ECD screening and counseling for developmental milestones and light-touch nutrition counseling in routine health facility clinical services (e.g. maternity, postnatal care, and growth monitoring and immunization) by clinical service providers such as nurses and clinical officers; 2) Playbox sessions in health facility waiting areas led by CHVs in order to make these spaces more child-friendly and integrate ECD counseling into lengthy wait times; 3) Integration of ECD counseling into home visits delivered by CHVs. Components 1 and 2 are collectively referred to as the health facility-based ECD intervention within this report, while Component 3 is referred to as the home-based ECD intervention.

In integrating ECD into health services, PATH, in a collaborative partnership with UNICEF and the World Health Organization (WHO), has adapted and expanded the module on Care for Child Development (CCD) (1). The module was originally developed by the WHO and UNICEF as a module of the Integrated Management of Childhood Illness (IMCI). PATH's CCD adaptation provides more comprehensive and effective ECD counseling and screening tailored to specific health system touch-points, and also provides strong emphasis on promotion of optimal nutrition practices.

The specific aim of CCD is to improve mother/caregiver awareness, sensitivity, and responsiveness to a young child's learning and emotional needs, which in turn will result in improved childcare practices

and consequently child developmental outcomes. PATH's approach focuses on the ongoing capacity building of service providers and their supervisors as well as strengthening the enabling environment.

The intervention package is based on the training and mentoring of facility-based health service providers (primarily nurses and clinical officers) and CHVs on play and communication. In the health facility-based ECD intervention, health service providers integrate ECD counseling and screening along with light-touch nutrition counseling into the following touch points that form part of the National Immunization Schedule (NIS) in Kenya: immunizations given at birth or shortly after birth OR postnatal care visits; 6-week immunization visits; 10-week immunization visits; 14-week immunization visits; 6-month vitamin A supplementation visits; and 9-month immunization visits.

In the health facility-based ECD intervention, mother/caregiver-child dyads are also exposed to playboxes (see Photos 1 and 2) during the health facility visits. The playbox session includes ECD-related information and specifically teaches caregivers how to engage in play with their child through responsive caregiving techniques and use of homemade toys. In the home-based ECD intervention, mother/caregiver-child dyads receive home-based counseling on ECD by CHVs, who are trained to integrate this content into their routine monthly home visits that are mandated by the MOH. PATH is training and mentoring facility-based service providers and CHVs to deliver the health facility-based ECD intervention and the home-based counseling, respectively.



Photo 1. Playbox session at the health facility



Photo 2. Some of the playbox materials in use at the health facilities

## 1.3 Study Objectives

The general objective of the proposed work is to evaluate the feasibility and effectiveness of the health facility-based and health facility-based plus home-based ECD intervention in Siaya County, Western Kenya. The specific objectives include:

- To determine the effect of the health facility-based and health facility-based plus home-based ECD intervention on mother/caregiver ECD KAPs;
- To determine the effect of the health facility-based and health facility-based plus home-based ECD intervention on child growth and developmental outcomes for children aged 0-3 years;
- To determine the operational feasibility of the health facility-based and health facility-based plus home-based ECD intervention;
- To estimate the costs and cost-effectiveness of the health facility-based and health facility-based plus home-based ECD interventions from the provider's (health system) perspective.

### Outcomes

#### Primary outcome

- Caregiver's knowledge, attitudes, and practices regarding early child development (stimulation and responsive caregiving)

#### Secondary outcomes

- Child growth and developmental outcomes
- Operational feasibility, cost and cost-effectiveness of the health facility-based plus home-based ECD intervention





## Chapter Two

### Methods

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This section presents information on: the design that was utilized; tools and instruments; sample and sample size determination; selection of health facilities; recruitment of caregivers and administration of the questionnaire; training of field teams; and, the data management process.

#### 2.1 The Study Design

The current study designed as a cluster-randomized controlled trial (c-RCT), aims to evaluate the effectiveness of the health facility-based ECD intervention only and the combined health facility- and home-based ECD interventions in relation to changes in mother/caregiver KAPs, and any changes in child growth and developmental status. In addition, the study evaluates the feasibility of implementing the intervention in the real-world health system context. The study also investigates the costs and cost-effectiveness of the facility-based intervention. The study involves the pre-intervention (baseline) survey, intervention phase, and a longitudinal follow up of the caregiver-child dyads for a period of 27 months. At the baseline, we utilized both qualitative and quantitative methodologies. However, this report focuses on the findings from the baseline quantitative data collection activities. (The report on qualitative data collection activities is presented as a separate document). The baseline survey was conducted between May and August 2018.

There are three arms in the c-RCT. In one arm, mother/caregiver-child dyads only receive the health facility-based ECD intervention that is integrated into the routine facility-based MoH service touch-points. In addition, they receive home visits from CHVs per the MoH-mandated schedule, but these home visits do not integrate any ECD content. In the second arm, mother/caregiver-child dyads receive the health facility-based ECD intervention combined with the home-based ECD intervention that is integrated into routine CHV home visits. The third arm receives the current Ministry of Health's (MoH's)

standard care only, which includes the routine immunization and supplementation services mentioned previously and CHV home visits that do not integrate ECD content. After delivery, mother/caregiver-child dyads in two arms receive the health facility-based ECD intervention through the six MoH touch-points described earlier over a span of nine months. In one of the arms, they will also start to receive the home-based ECD intervention as soon as possible after recruitment. Once the mother/caregiver-child dyads have received the facility-based ECD intervention, they will be encouraged to return to the health facility for follow-up visits (for data collection) once every nine months over the course of the remaining study period. These follow-up visits will be aligned with routine growth monitoring visits to the health facility that are recommended by the Kenyan MoH.

## 2.2. Selection of Health Facilities

Within the study sub-county (Bondo), health facilities were randomly selected from each of the six wards and stratified at the ward level to reduce potential contamination among study arms. The selection criteria included public health facilities with at least two clinical service providers (e.g. one nurse + one clinical officer) and availability of MCH and maternity sections. The selected health facilities were randomly allocated to receive either the health facility ECD intervention, the health facility ECD intervention combined with home-based counseling, or the standard care. Public health facilities of any level that fulfilled the stated criteria were considered except for the referral hospital (which receives patients from the entire sub-county) which was excluded in order to minimize potential contamination. Appendix 1 provides an overview of the characteristics of the facilities.

## 2.3 Sample Size Determination

The sample size calculation was done by considering pair-wise comparisons based on the assumption of 20% loss to follow-up and 80% power of detecting an effect size of 0.4 either in arm 1 (ECD health facility-based) or 2 (ECD health facility-based plus home-based) compared with arm 3 (control). We followed Hemming et al's (20) paper to estimate the sample size. We assume that the current ECD program could yield an effect size of 0.4 in terms of ECD practices with an intra-cluster correlation (ICC) of  $\rho=0.03$ . We also conjectured a confidence interval of 95%, a margin-of-error of 5% and a power of 80%.

As previously indicated, we generated three groups of mother/caregiver-child dyads; one group to receive the facility-based ECD intervention, another group to receive the facility-based intervention combined with home-based counseling and the third group to receive the standard care. We purposed to recruit 233 caregivers for each arm (1, 2 and 3). The estimated cluster size of caregivers in each of the six equally-sized clusters per arm was 39 (233/6) caregivers per health facility. The estimated attrition rate was based on a study carried out in Western Kenya on improving infant feeding practices which found an average dropout rate of 8% over a nine-month follow-up period (21). Therefore, the total sample size for the entire study was estimated at 699 mother/caregiver-child dyads with 233 mother/caregiver-child dyads and six health facilities in each arm. However, the field team recruited a total of 792 of which 271 were from the control arm, 260 from arm one and 261 from arm two as shown in Appendix 2. It is worth

noting that we expected to recruit 39 caregivers per facility; however, some facilities ended up with more caregivers than others.

## 2.4. Recruitment and Training of the Field Team

The members of the field team were recruited competitively in line with the APHRC standards. They all had bachelor's degree in related fields as well as experience in data collection within the study area. All field workers (for qualitative and quantitative data collection), and the field supervisor/quality assurance monitor were fluent in both English and Kiswahili as well as Dholuo, which is the local language of the study area. They were also all residents of the study area. After recruitment, data collectors were trained in line with APHRC's standards. The research team conducted a one-week training on ethical issues, data collection procedures, and data quality. This training was both information- and problem-solving based. Additionally, a field supervisor to coordinate field work and ensure quality of data through spot checks and editing of the collected data, was also trained.

## 2.5 Pre-testing of Tools

After the training, the team was deployed under the leadership of the APHRC research team for pre-testing of the tools. After the pre-testing, a debriefing session was held to finalize the data collection tools based on the results of the pilot exercise. The purpose of the pre-testing was to find out if there were items that caregivers would find difficult to understand and respond to, and also to seek their suggestions on how these items could best be rephrased. Some items were rephrased during the debrief session. We also established with the caregivers whether the interview was of an appropriate length and made the necessary adjustments.

## 2.6 Study Tools

The ECD KAP questionnaire administered to the caregivers at the baseline will also be used during the follow-up periods. As outlined in Appendix 3, different questions were used to construct our primary outcomes (knowledge, attitudes and practices on childrearing). Caregiver KAP were measured using a set of questions that cover topics such as appropriate feeding practices and play and learning activities likely to promote holistic development in children. The costing study focused on the costs incurred by the health system (e.g. by government, donors) for the preparation and delivery of the ECD intervention. Our units of analysis are the health facility and child/caregiver dyads. The sources of data are the financial reports. The costs incurred will be grouped under three components; pre-implementation, recurrent and capital costs. Qualitative data collection involved key informant interviews (KIIs) with six county government officials and 18 facility in-charges. We also conducted eight focus group discussions (FGDs) with (CHVs) and 11 in-depth interviews (IDIs) with caregivers (Table 1).

Based on the research objectives, themes were generated on the perceptions of the current services provided, current child care practices, perceived barriers, and facilitators to the intervention as well as perceived challenges.

## 2.7 Recruitment of Mothers/Caregivers and Data Collection

We employed a consecutive sampling technique until the desired sample size was attained. We selected all women attending antenatal clinic (ANC) services during their third trimester of pregnancy who met the inclusion criteria and agreed to participate in the study. During the ANC visit to the health facility, we collected socio-demographic information such as education level, age, and occupation from caregivers, as well as information on ECD knowledge.

Intervention/study monitors will encourage each recruited mother/caregiver to attend all the six facility-based touch points according to the NIS in a timely manner. They will also enhance the fidelity of the intervention by ensuring that all recruited mother/caregiver-child dyads receive the ECD intervention when they come to the facility for the services. The study monitors will track the participating caregivers through mobile phone (voice call or short message) reminders and home-visits in case a mother/caregiver fails to arrive for a visit at the health facility on the scheduled date. Children in all arms will also receive routine MoH-mandated health services during health visits (e.g., weighing, height/length measurement, immunizations, and sick childcare).

**Table 1:** → Description of interviews conducted with different participants

Participants	Type of interview	Number of interviews	Description of the participants
Healthcare Providers	Key Informant Interviews (KII)	18	Healthcare providers consisted mainly of nurses who doubled up as facility in-charges. There were a few clinical officers who represented the in-charges. The participants in this category were drawn from all the sampled facilities.
Community Health Volunteers	Focus Group Discussions (FGD)	8 groups, each consisting of 6-8 CHVs	This group consisted of community health volunteers who support the health systems within the household. They are targeted in this intervention as the link between the facility and the households.
Caregivers/ mothers	In-depth interviews (IDI)	11	This group consisted of primary caregivers who had children below 3 years and were not part of the quantitative study.
Health Management Team	Key Informant Interview (KII)	6	This group consisted of key policymakers/ implementers within the sub-County. The team included the sub-County Public Health Nurse, the sub-County Public Health Officer, the sub-County Reproductive and Maternal Health Coordinator, the sub-County Community Health Strategist and the sub-County Health Services Coordinator.

## 2.8 Data Management and Quality Assurance

To ensure quality data, baseline data collection was supervised by carefully trained team leaders and the research team. During fieldwork, data quality was enhanced by the APHRC and PATH team leads through regular spot checks and sit-ins for approximately 5-10% of each field worker's daily work to verify the authenticity of data collected. The field supervisor certified the quality through editing of the data before they were transferred to a central database. Data collection was done electronically using tablets/phones. Once the data collection was completed, all inconsistencies were resolved prior to analysis.

## 2.9 Data Analysis

After the data were cleaned, quantitative data analysis was performed using Stata. All analyses were done separately with arm 1 (health facility-based ECD intervention [HF-based]) being compared with arm 3 (control), and arm 2 (health facility-based plus home-based ECD intervention [HF + Home-based]) being compared with arm 3 (control). Initial analyses consisted mainly of descriptive statistics. This allowed us to detect similarities and/or differences in subjects' characteristics across the different groups. We then compared the baseline measurements between the control group and intervention group using the t-test adjusted for clustering at the health facility level for continuous variables, and cluster-adjusted chi-square for binary variables.

## 2.10 Ethical Considerations

Prior to recruitment and interview, the research team obtained informed consent from each participant. All participants in the study were informed about: the study goals and procedures, including a description of how confidentiality would be maintained; and, the voluntary nature of study participation, as well as any risks and benefits associated with the participation. The informed consent form detailed the purpose of the study and emphasized that participation of the study was voluntary and that they could choose not to participate in the study or answer any section of the interview. Participants were requested to read through the consent document before the interview. However, most participants could not read and were therefore assisted by the research team. Their signatures were witnessed by either the CHV or the nurse at the facility. Only those who agreed to participate were recruited and subsequently interviewed.

# Chapter Three



## Results

### 3.1 Summary of the Qualitative Findings

This section provides a summary of the qualitative findings (the main report is available as a separate document). Generally from the findings, the stakeholders perceived that children in the communities were growing well. This was attributed to positive health-seeking behaviors such as uptake of immunization, improved nutrition supplementation, attending ANC during pregnancy as well as exclusive breastfeeding for at least six months. Caregivers reported that there was limited engagement with their children in some play and communication activities because of other competing needs such as looking for food, work, and business. Some felt that it was awkward for adults to play with young children, while others thought that young children cannot play. CHVs provided some guidance to the caregivers on the importance of play and communication during health talks at the facility. According to the healthcare providers, early learning and stimulation is a school activity and not health facility related. On infant feeding and nutrition, some caregivers reported that they practiced exclusive breastfeeding. However, the majority faced challenges from other family members such as grandmothers or husbands who felt that children who were exclusively breastfed were starving and should be given other foods. These caregivers also reported that they lacked equipment to store the breast milk while they were away from home.

A range of services are currently provided to the children and their caregivers. These include immunization, nutritional supplementation, MCH, and ANC services. The uptake of these services was reported to be good as a high percentage of caregivers go for skilled delivery and attend ANC clinics. However, play and communication activities were not mentioned as regular activities in the facilities. The facilities did not have spaces set aside for children to play. Some facilities had spaces for watching TV, but these did not cater for the children. The healthcare providers and CHVs perceived that the services met the needs of caregivers, and rated their quality as 'good.'

During the interviews with members of the sub-County Health Management team (SCHMT), the respondents mentioned that there were no ECD policies on play and communication that recommend the integration of ECD content into the health systems. What was available in the county are general policies and guidelines such as the Child Rights Policy, and the Early Identification of Disabilities Policy. An array of challenges was reported in line with support for service provision to children. Dependence on spousal support burdens the family which in turn, affects children's growth and development. Distance to the facility and work were a threat to proper child care. Health facilities cited poor staffing, lack of infrastructural space as well as poor referral systems as major challenges. CHVs mentioned that poor remuneration was a key issue affecting their service provision.

Healthcare providers and members of the SCHMT perceived the intervention as being key in addressing some of the developmental issues within the county. They perceived the intervention as being valuable to their work and pledged to support it. Key facilitators that were identified included trained CHVs, support from the county, formal training in child health and the availability of a robust community health strategy. Barriers such as lack of enough personnel and space, competing activities such as fishing, negative traditions, and low male participation were also highlighted.

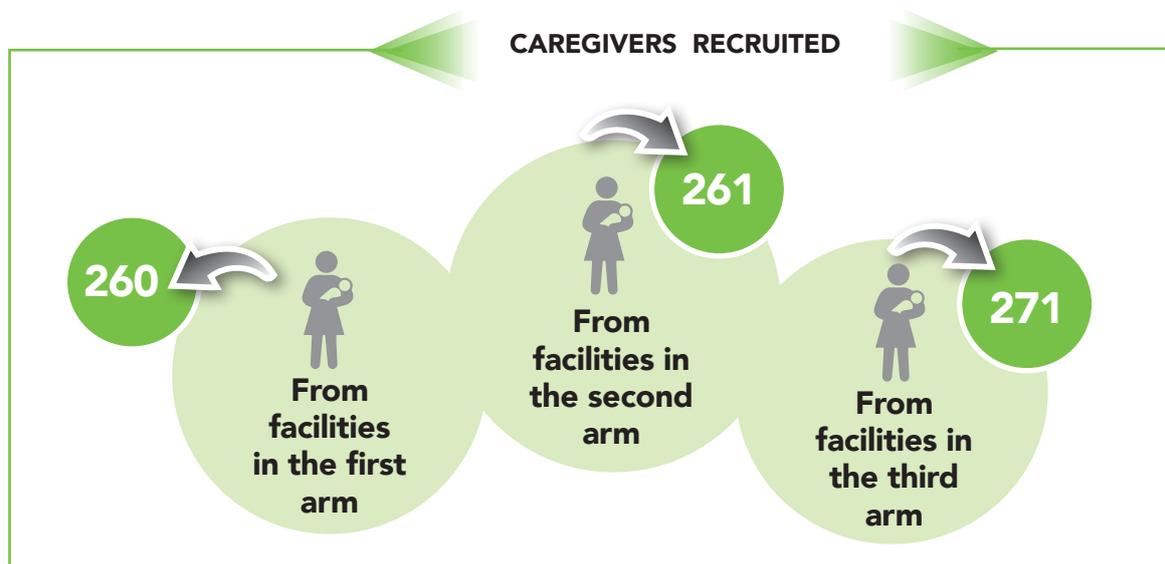
In conclusion, the health systems stakeholders perceived the integration of ECD into the health systems as feasible and acceptable within the community. They undertook to provide the necessary support within the facility and at the community level for proper integration.

## 3.2 Quantitative Results

### 3.2.1 Demographic Characteristics of Study Participants

A total of 792 caregivers were recruited to participate in this study; 260 (32.28%) from facilities in the first arm (HF-based), 261 (32.95%) from facilities in the second arm and 271 (34.22%) from facilities in the third arm.

As shown in Table 2, the caregivers recruited into the study were generally young with a mean age of 25 years. Fathers tended to be older (mean age = 33 years). There were no significant differences in the mean age of caregivers recruited, as well as fathers, across the three arms.



In terms of education, our findings revealed that across all the groups, the majority of primary caregivers (more than 60%) had either attained some primary school education or completed this level. There was no significant difference across the three arms. The findings on fathers' education illustrated that more than half the fathers had either completed primary education or had attained some years of secondary education. As with primary caregivers, the differences in proportion of fathers at each education level across the arms were not significant.

The majority (80% or more) of the primary caregivers across all the arms were married or living with their spouses. The remainder in each group were not in any union (never married, divorced, separated and widowed). Close to 100% of the primary caregivers in all the arms considered themselves Christians, with no significant differences across arms.

With regards to employment, we combined those who were employed and self-employed in one group. Those who were self-employed were engaged in activities such as farming, fishing and small-scale businesses.

Household ownership of a variety of assets, including communication and transport assets such as radio, bicycle, motorbikes, mobile phones, and access to amenities such as toilets and electricity was used as a proxy measure of socioeconomic status. Household socioeconomic status was computed by summing the scores on a checklist on the number of items owned or that a household has access to. Wealth quintiles were derived from these scores. The proportion of caregivers within the different quintiles varied across all the study arms.

The three arms were generally similar with regards to demographic characteristics, that is, the differences shown were not statistically significant (Table 2). These findings suggest that there was baseline balance at the beginning of the project before any of the intervention activities began.

**Table 2:** → **Socio-demographic characteristics of study participants**

	Control	HF-based	p-value	HF + Home-based	p-value
N (%)	271 (34.22)	260 (32.28)		261 (32.95)	
Age (yrs) of primary caregivers, M (SD)	25.0 (7.89)	25.9 (5.83)	0.18	25.9 (5.88)	0.18
Age (yrs) of fathers, M (SD)	33.5 (13.31)	33.4 (10.96)	0.94	33.4 (8.9)	0.98
<b>Education (primary caregivers)</b>					
No education	0	4 (1.55)		2 (0.8)	
Primary incomplete	79 (29.2)	96 (37.2)		78 (29.9)	
Primary complete	91 (33.6)	81 (31.4)	0.77	92 (35.3)	0.93
Secondary incomplete	55 (20.3)	41 (15.9)		42 (16.1)	
Secondary complete	33 (12.2)	28 (10.9)		37 (14.2)	
More than secondary	13 (4.8)	8 (3.1)		10 (3.8)	
<b>Education (fathers)</b>					
No education	1 (0.49)	2 (1.01)		1 (0.50)	
Primary incomplete	39 (19.02)	38 (19.10)		29 (14.57)	
Primary complete	67 (32.68)	78 (39.20)		69 (34.67)	
Secondary incomplete	50 (24.39)	27 (13.57)	0.12	38 (19.10)	0.37
Secondary complete	29 (14.15)	37 (18.59)		48 (24.12)	
More than secondary	19 (9.27)	17 (8.54)		14 (7.04)	
<b>Marital status</b>					
Married	219 (80.81)	207 (79.62)	0.73	211 (80.84)	0.99
Not married	52 (19.19)	53 (20.38)		50 (19.16)	
<b>Religion</b>					
Christians	267 (98.52)	259 (99.62)	0.19	257 (98.47)	0.96
Non-Christians	4 (1.48)	1 (0.38)		4 (1.53)	
<b>Occupation (primary caregivers)</b>					
Employed	117 (43.17)	123 (47.31)		123 (47.13)	
Unemployed	127 (46.86)	129 (49.62)	0.11	125 (47.89)	0.28
Non-economically active	27 (9.96)	8 (3.08)		13 (4.98)	
<b>Occupation (fathers)</b>					
Employed	136 (61.82)	115 (55.56)		63 (29.86)	
Unemployed	3 (1.36)	5 (2.42)	0.9	6 (2.84)	0.93
Non-economically active	81 (36.82)	87 (42.03)		21 (9.95)	
<b>Wealth quintiles</b>					
Lowest	50 (18.45)	32 (12.31)		78 (29.89)	
Second	52 (19.19)	41 (15.77)		72 (27.59)	
Middle	57 (21.03)	104 (40.00)	0.84	63 (24.14)	0.72
Fourth	46 (16.97)	26 (10.00)		21 (8.05)	
Highest	66 (24.35)	57 (21.92)		27 (10.34)	

### 3.2.2 Antenatal Care (ANC) Clinic Visits

We sought to understand the status of antenatal care visits by the caregivers who had been recruited into the study. The results showed that almost all the participants across the three groups received care during their pregnancy (Table 3). The proportion of primary caregivers who received ANC services within the first three months of pregnancy was lower in the HF-based and HF + Home-based arms than that in the control arm (33.1% and 19.5% vs 46.9%). The differences across the arms were significant ( $p=0.04$ ), with the control having more than twice the proportion of mothers than in the intervention arms. More than half of the primary caregivers in the intervention arms had received ANC services at between four and six months of pregnancy. These proportions were significantly higher ( $p=0.04$ ) than that for the primary caregivers in the control arm (46.5%).

Generally, the MoH recommends at least four ANC visits before delivery. The findings revealed that many of the study participants did not adhere to these guidelines. Across all the groups (control – 60.2%; HF-based – 55.8%; HF + Home-based – 47.1%), the majority attended only between two to three ANC clinic visits. The proportion of those who attended the recommended number of ANC clinic visits (4+) was less than 25% across all the groups. A notable finding is that the proportion of women in the HF + Home-based arm who reported that they did not receive any antenatal care during their current pregnancy was almost four times that of the control. These differences were however not statistically significant. These low levels suggest that there is an opportunity for improving attendance of the recommended number of ANC clinic visits by pregnant women. Information on ANC uptake and number of clinic visits attended is presented in Table 3.

### 3.2.3 ECD Counseling during the ANC Clinic Visits

We asked the study participants if they had received any ECD counseling during the ANC clinic visits. The majority (more than 50% across all arms) of caregivers reported that they did not receive any ECD-related counseling during their ANC visits, with higher proportions in the control arm than in intervention arms. The proportion of those reporting that they had received some ECD-related information was higher in the intervention arms than in the control arm. However, these differences were not significant, as shown in Table 3.

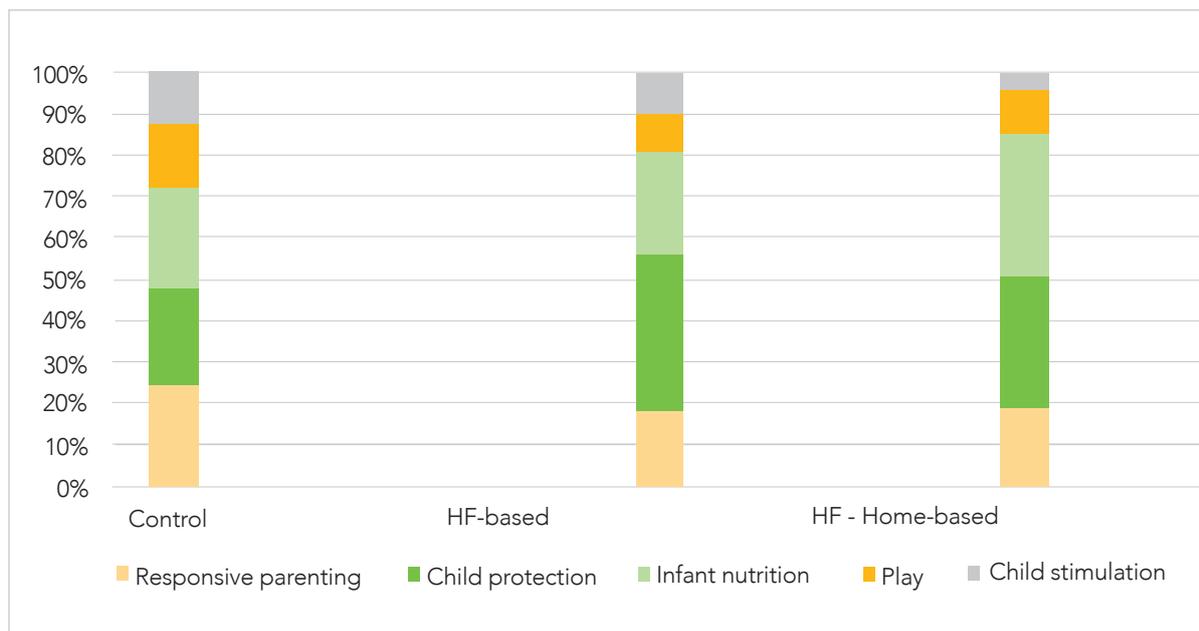


**The MoH recommends at least four ANC visits before delivery. The findings revealed that many of the study participants did not adhere to these guidelines. Across all the groups (control – 60.2%; HF-based – 55.8%; HF + Home-based – 47.1%), the majority attended only between two to three ANC clinic visits.**

**Table 3:** → **ANC uptake and ECD counseling during ANC clinic visits**

N	Control 271	HF-based 260	p-value	HF + Home-based 261	p-value
<b>Have you received any care during this pregnancy?</b>					
Yes	262 (96.68)	248 (95.38)	0.75	216 (82.76)	0.13
No	9 (3.32)	12 (4.62)		45 (17.24)	
<b>How many months pregnant were you when you first received antenatal care?</b>					
No care received	9 (3.32)	13 (5.0)	0.57	46 (17.62)	0.04
Within 3 Months	127 (46.86)	86 (33.08)		51 (19.54)	
Between 4 and 6 Months	126 (46.49)	154 (59.23)		150 (54.47)	
More than 6 Months	9 (3.32)	7 (2.69)		14 (5.35)	
<b>How many times have you received antenatal care during this pregnancy?</b>					
None	9 (3.32)	13 (5.00)	0.89	46 (17.62)	0.28
Once	44 (16.24)	39 (15.00)		47 (18.0)	
2 – 3 times	163 (60.15)	145 (55.77)		123 (47.13)	
4+ times	55 (20.3)	63 (24.23)		45 (17.24)	
<b>Did you receive any ECD counseling during ANC visits?</b>					
Yes	64 (23.62)	109 (41.92)	0.29	80 (30.65)	0.59
No	207 (76.38)	151 (58.08)		181 (69.35)	

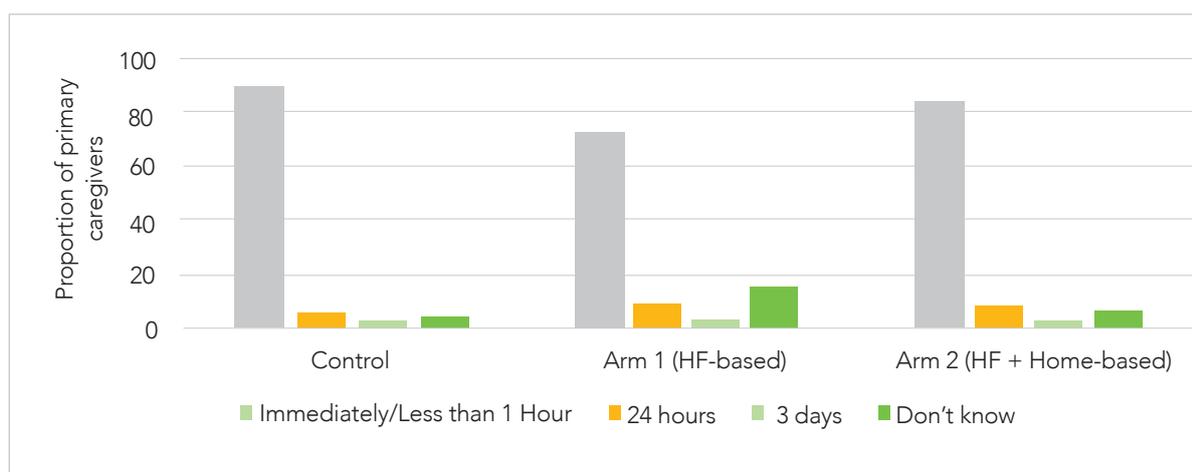
For those who received counseling during the ANC clinic visit, the caregivers reported that they got information on responsive parenting, child stimulation, play, child protection and infant nutrition (Figure 1). Although the proportion of caregivers who reported having received information on child protection and infant nutrition was higher in the intervention arms compared to the control arm, these differences were not significant.



**Figure 1:** Summary of types of ECD-related information received

### 3.2.4 Timing of Breastfeeding after Birth

The study findings revealed that most caregivers have good knowledge about breastfeeding. The majority (more than 70% across all the arms) of the caregivers, with higher proportions in one group than in the other two groups, stated that a baby should be put to breast immediately after birth. There were no significant differences across the three arms. Figure 2 illustrates this information.



**Figure 2:** Timing of breastfeeding after birth

### 3.2.4.1 Breastfeeding Cessation

When we asked participants when they thought a baby should stop breastfeeding, the proportion of caregivers who mentioned that a child should stop breastfeeding after 12 months varied from 41% to 81.5%. The differences across the arms were however not significant (Table 4).

We also asked participants when they intended to stop breastfeeding their children. Similar proportions (80% and 77.5%) in two arms (HF-based and control) mentioned that they would breastfeed for more than 12 months. On the other hand, the proportion of those in the HF + Home-based arm who mentioned that they would breastfeed for more than 12 months was half of that in the control arm. It should be noted however, that the proportion of those in HF + Home-based arm who reported that they intended to breastfeed their children for less than six months was remarkably high, at 34%. As shown in Table 4, the differences across the arms were not significant.

**Table 4:** → **Participants' knowledge of breastfeeding**

	Control	HF-based	p-value	HF + Home-based	p-value
<b>How long after birth should a baby be put to the breast?</b>					
Immediately/Less than 1 Hour	241 (88.93)	191 (73.46)	0.23	219 (83.91)	0.34
Hours	14 (5.17)	25 (9.62)		23 (8.81)	
Days	3 (1.11)	2 (0.77)		2 (0.77)	
Don't Know	13 (4.80)	42 (16.15)		17 (6.51)	
<b>In your opinion, at what age should a baby stop breastfeeding?</b>					
Below 6 Months	1 (0.37)	6 (2.31)	0.56	87 (33.33)	0.13
Between 6 to 12 Months	73 (26.74)	42 (16.15)		67 (25.67)	
More Than 12 Months	197 (72.69)	212 (81.54)		107 (41.00)	
<b>How long do you intend to breastfeed your child?</b>					
Below 6 Months	10 (3.69)	9 (3.46)	0.97	88 (33.72)	0.15
Between 6 to 12 Months	51 (18.82)	43 (16.54)		68 (26.05)	
More Than 12 Months	210 (77.49)	208 (80.00)		105 (40.23)	

### 3.2.4.2 Responsive Feeding

Responsive feeding is a very important aspect of responsive parenting so we sought to understand caregivers' knowledge about it. We asked for the different ways that caregivers thought a child could be encouraged to eat. Table 5 provides a summary of caregivers' responses across the three arms. The most commonly mentioned responses across the three arms were talking to the baby and promising rewards to the baby. Other commonly mentioned responses included changing the texture of the food, allowing the baby to feed him/herself and singing to the baby. There was no significant difference between the control group and the intervention groups in these responses.

**Table 5:** → **Ways in which to encourage a child to eat**

	Control	HF-based	p-value	HF + Home-based	p-value
<b>What are some ways that a child can be encouraged to feed? N (%)</b>					
Shout/yell at the baby	1 (0.37)	2 (0.77)	0.65	3 (1.15)	0.5
Beat/pinch the baby	2 (0.74)	3 (1.15)	0.78	2 (0.77)	0.98
Threaten/instill fear in the baby	5 (1.85)	2 (0.77)	0.37	11 (4.21)	0.24
Force the baby to finish	27 (9.96)	37 (14.23)	0.42	48 (18.39)	0.25
Promise rewards to the baby	122 (45.02)	86 (33.08)	0.48	82 (31.42)	0.4
Change position of the baby	37 (13.65)	7 (2.69)	0.25	23 (8.81)	0.61
Follow the child around the room	69 (25.46)	0	0.24	24 (9.20)	0.29
Talk to the baby	195 (71.96)	132 (50.77)	0.21	151 (57.85)	0.34
Sing for the baby	66 (24.35)	26 (10.00)	0.33	63 (24.14)	0.99
Refocus baby's attention with play	55 (20.30)	7 (2.69)	0.24	34 (13.03)	0.62
Slow the pace of feeding	41 (15.13)	33 (12.69)	0.80	77 (29.50)	0.11
Allow the baby to touch food/feed themselves	81 (29.89)	8 (3.08)	0.12	53 (20.31)	0.59
Change texture/variety of the food	93 (34.32)	59 (22.69)	0.52	91 (34.87)	0.98

### 3.2.5 Caregiver KAP

Caregivers' knowledge and attitudes were measured through questions related to breastfeeding, early stimulation, learning, and health visits (Appendix 3). As higher scores denoted more positive attitudes, the mean caregiving KAP indicated that caregivers across the three arms agreed with many of the statements presented. There were no significant differences between the intervention and control arms (Table 6).

When asked what they liked most about caregiving, a higher proportion of caregivers in the intervention arms than in the control arm mentioned that they liked showing children love. On the other hand, a greater proportion of the caregivers in the control compared to the intervention arms mentioned that they liked playing with children. When asked what they did not like about caregiving, more than 70% of caregivers across the three arms mentioned that there was nothing they did not like (Table 6).

**Table 6:** → Caregiver KAP

	Control	HF-based	p-value	HF + Home-based	p-value
N (%)	271 (34.22)	260 (32.28)		261 (32.95)	
Caregiver knowledge	2.68 (0.25)	2.53 (0.27)	0.17	2.55 (0.23)	0.13
<b>What do you like most about caregiving?</b>					
Nothing	0	15 (5.77)	0.43	12 (4.60)	0.93
Playing with the children	112 (41.33)	28 (10.77)		58 (22.22)	
Feeding the children	54 (19.93)	33 (12.69)	0.77	67 (25.67)	0.93
Protecting the children	30 (11.07)	80 (30.77)		27 (10.34)	
Showing them love	28 (10.33)	63 (24.23)		43 (16.48)	
Cleaning them	26 (9.59)	22 (8.46)		38 (14.56)	
Reading for them	3 (1.11)	9 (3.46)		4 (1.53)	
Other practices	18 (6.64)	10 (3.85)		12 (4.60)	
<b>What don't you like most about caregiving?</b>					
Nothing	194 (71.59)	186 (71.54)	0.94	189 (72.41)	0.83
Playing with the children	4 (1.48)	10 (3.85)		8 (3.07)	
Feeding the children	21 (7.75)	9 (3.46)		1 (0.38)	
Protecting the children	1 (0.37)	3 (1.15)	0.12	0	0.37
Showing them love	5 (1.85)	12 (4.62)		1 (0.38)	
Cleaning them	16 (5.90)	3 (1.15)		3 (1.15)	
Reading for them	2 (0.74)	3 (1.15)		8 (3.07)	
Other practices	28 (10.33)	34 (13.08)		51 (19.54)	

### 3.2.6 Cost profile and unit costs

Preliminary results from the costing study suggest that the main driver of the costs incurred in this study is the personnel cost, as it accounts for more than 80% of the cost of the intervention activities. The intervention is not capital intensive. The unit costs for HF + Home-based arm are nearly twice as much as those for the HF-based, which is similar to the rates seen for cost per child enrolled in the health facility. When the personnel costs are excluded, the costs per child enrolled in the two arms are considerably lower.

The results of the costing may be inflated since most of the inputs of the PATH staff (salaries) are included in the analysis. For the purpose of scale-up, the Kenyan government may not need these staff who were solely involved in the design, and oversee implementation of all project activities. Furthermore, most of these staff are paid using international standards which are far from what the government may offer. Such a strategy could be more plausible since other studies have adopted this strategy of lower and scalable ECD interventions integrated at the health facility (22). In this case, the main driver of the cost is the pre-implementation activities such as coordination meetings, sensitization, training and capacity building which accounts for 83% and 86% of the total cost for the intervention, respectively. The detailed results of the costing study are presented in a separate document.



## Chapter Four

### Discussion

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We conducted baseline data collection among pregnant women when they visited various health facilities during the third trimester of pregnancy. The study, designed as a c-RCT, involved 18 health facilities in Bondo sub-County. Six facilities were allocated to each of three study arms; Arm 1, (health facility-based) Arm 2 (health facility + home-based) and Arm 3 (control).

The findings from the baseline study revealed that there was baseline balance across the study arms with regards to the demographic characteristics of primary caregivers and fathers, as well as on primary caregivers' knowledge and attitudes. As caregivers' demographic characteristics may influence their behavior as well as child growth and development, knowledge of the baseline characteristics of participants is important for interpreting the results and determining the effects of the intervention (23). Generally, in Kenya and other similar sub-Saharan African countries, it is difficult for people to get meaningful jobs with just a basic education. From the findings, the majority of primary caregivers mentioned that they are not employed, which seemed to be associated with their education levels as a large proportion had only attained some primary education or completed primary education. Another possible reason for the low employment levels among primary caregivers is the lack of appropriate job opportunities. Understanding education and occupational status of caregivers is important since the two have been found to have a significant association with health outcomes (24). Better education may enhance the ability of households to put interventions into practice (25), thus improving child growth and development.

Despite the government recommendation for pregnant women to attend at least four ANC clinics before delivery, the majority of caregivers attended about 2-3 times. Poor uptake of ANC services has been attributed to long distances to the facility, payment for laboratory services, long wait-times at the health facilities and negative attitudes displayed by healthcare workers (26). Some of these reasons were highlighted in focus group discussions with caregivers (see detailed qualitative report). Identification of barriers to uptake of services is a good first step in making efforts to improve access to services for pregnant women.

Counseling on ECD content is a major driver of this intervention. However, a large percentage of caregivers mentioned that they were not counseled on any ECD content during their ANC visits to the facility. This could be attributed to health workers' lack of knowledge on the importance of play and communication during the early years. We anticipate that the intervention will fill this gap.

Infant and young child feeding is key in child growth and development and impacts the later healthy development of children. Caregivers seem to have good knowledge of breastfeeding as majority of them mentioned that children should be put to breast less than one hour after birth. In addition, apart from mentioning that children should breastfeed for more than one year, most caregivers indicated their intention to breastfeed their children for more than 12 months. Increase in exclusive breastfeeding uptake by many mothers in Kenya can be attributed to a robust community health strategy and enduring awareness creation by CHVs. With this same community health strategy, many caregivers can be reached on areas on play and communication within the current intervention. Some limitations arose that should be taken into account when reviewing the findings. One is that although we intended to recruit 39 mothers from each health facility, the numbers varied greatly, from as low as 10 to as high as 79 in some of the health facilities. In planning our sample size, we used data from the District Health Information System (DHIS), and the disparity may be attributed to poorly-kept records or low attendance of ANC clinics by caregivers. Another limitation is that some mothers misreported their expected due dates, and whereas the plan was to recruit them during the third trimester, some gave birth within a few days of being recruited. As a result of this, we over-recruited in some of the health facilities to compensate for possible higher rates of attrition by women who gave birth earlier than anticipated. These mothers may have to be dropped from the sample as by the time they gave birth, health facility workers had not yet received training on ECD counseling which would therefore mean that the mothers would not receive the recommended dosage of exposure to the intervention.



## Chapter Five

# Conclusion and Recommendations

## 5.1. Conclusion

Given the similarity in characteristics of the caregivers across the three arms, the stage is set for a robust evaluation of the effectiveness of the intervention in terms of changes in caregivers' KAP. The baseline balance will allow for differences observed at the end of the intervention to be attributed to the intervention itself, rather than to differences in baseline characteristics. The finding that the majority of primary caregivers indicated they had not received any ECD messages during the ANC visits provides a good entry point for implementing changes in the way information on child stimulation is passed on to caregivers at the health-facility level. There is a robust community strategy in place and this provides a good platform for the intervention activities as they can be embedded within the existing structures. Preliminary results from the costing study suggest that the main driver of the costs incurred in this study is the personnel cost, as it accounts for more than 80% of the cost of the intervention activities. The intervention is therefore not capital intensive, suggesting potential flexibility in scaling.

## 5.2. Recommendations

The following are some key recommendations arising from the study findings:

- Pregnant women should be encouraged to visit health facilities early on in their pregnancies, as this will provide an opportunity for them to receive and internalize child stimulation messages before delivery;
- The retention of some of the learnings that primary caregivers receive through the integrated ECD intervention could be enhanced through discussions during mother-to-mother group meetings. Primary caregivers could be encouraged to set up such groups, which could be facilitated by CHVs;
- Primary caregivers should be encouraged to share the messages they receive with other members of their households so that there is continued stimulation of the child, regardless of who is providing caregiving.

## References

1. UNICEF (2012). *Care for child development*. [cited 2017 Jul 6]; Available from: [https://scholar.google.com/scholar?hl=en&as\\_sdt=0,5&q=UNICEF/WHO,+Care+for+Child+Development+Package+in+Early+Childhood.+2012,+WHO](https://scholar.google.com/scholar?hl=en&as_sdt=0,5&q=UNICEF/WHO,+Care+for+Child+Development+Package+in+Early+Childhood.+2012,+WHO)
2. Black M.M, Walker S.P, Fernald L., Andersen C.T, DiGirolamo A.M, Lu C., et al. (2016). Early childhood development coming of age: science through the life course. *Lancet*. 0(0):60–70. Available from: <http://linkinghub.elsevier.com/retrieve/pii/S0140673616313897>
3. Britto P.R, Lye S.J, Proulx K, Yousafzai A.K, Matthews S.G, Vaivada T, et al. (2017) Nurturing care: promoting early childhood development [Internet]. Vol. 389, *Lancet*. 2017 [cited Jul 6]. p. 91–102. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673616313903>
4. Richter L, Daelmans B, Lombardi J, Heymann J. (2017) Investing in the foundation of sustainable development: pathways to scale up for early childhood development. *Lancet*. [cited 2017 Jul 6]; Available from: <http://www.sciencedirect.com/science/article/pii/S0140673616316981>
5. Dua T., Tomlinson M., Tablante E, Britto P, Yousfzai A, Daelmans B, et al (2016). Global research priorities to accelerate early child development in the sustainable development era. *Lancet*. (4). p. e887–9.
6. Walker SP, Wachs TD, Meeks Gardner J, Lozoff B, Wasserman GA, Pollitt E, et al. Child development: risk factors for adverse outcomes in developing countries. *Lancet*. 2016;369(9556):145–57.
8. Walker SP, Powell CA, Grantham-McGregor SM, Himes JH, Chang SM. (1991). Nutritional supplementation, psychosocial stimulation, and growth of stunted children: The Jamaican study. *The American Journal of Clinical Nutrition.*;54(4):642–8.
9. Engle P, Menon P, Haddad L. (2017). Care and nutrition: concepts and measurement. *World Development- Science Direct*. 1999 [cited Jul 10]; Available from: <http://www.sciencedirect.com/science/article/pii/S0305750X99000595>
10. Engle PL, Fernald LCH, Alderman H, Behrman J, O’Gara C, Yousafzai A, et al (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet.*;378(9799):1339–53. Available from: <http://www.sciencedirect.com/science/article/pii/S0140673611608891>
11. Chang SM, Grantham-McGregor SM, Powell CA, Vera-Hernández M, Lopez-Boo F, Baker-Henningham H, et al. (2015) Integrating a Parenting Intervention With Routine Primary Health Care: A Cluster Randomized Trial. *Pediatrics* [Internet].;136(2):272–80. Available from: <http://pediatrics.aappublications.org/content/136/2/272.short>
12. Slemming W, Saloojee H. (2013) Beyond survival: The role of health care in promoting ECD. *South African Child Gauge* [Internet]. [cited 2017 Jul 6]; Available from: <http://ci.org.za/depts/ci/pubs/pdf/general/gauge2013/Gauge2013HealthServices.pdf>
13. Ertem IO, Atay G, Bingoler BE, Dogan DG, Bayhan A, Sarica D. Promoting Child Development at Sick-Child Visits: A Controlled Trial. *Pediatrics* [Internet]. 2006;118(1):e124–31. Available from: <http://pediatrics.aappublications.org/cgi/doi/10.1542/peds.2005-2704>

14. Yousafzai A, Rasheed M, Rizvi A, Armstrong R. Effect of integrated responsive stimulation and nutrition interventions in the Lady Health Worker programme in Pakistan on child development, growth, and health. *LANCet* [Internet]. 2014 [cited 2017 Jul 6]; Available from: <http://www.sciencedirect.com/science/article/pii/S0140673614604554>
15. Grantham-Mcgregor SM, Fernald LCH, Kagawa RM, Walker S. Effects of integrated child development and nutrition interventions on child development and nutritional status. *Ann N Y Acad Sci*[Internet]. 2014;1308(1):11–32. Available from: <http://onlinelibrary.wiley.com/doi/10.1111/nyas.12284/full>
16. Powell C, Baker-Henningham H, Walker S, Gernay J. Feasibility of integrating early stimulation into primary care for undernourished Jamaican children: cluster randomised controlled trial. *BMJ* [Internet]. 2004 [cited 2017 Jul 6]; Available from: <http://www.bmj.com/content/329/7457/89.short>
17. Tomlinson M, Hartley M, Roux I Le. The Philani Mentor Mothers Intervention: neighbourhood wide impact on child growth in Cape Town’s peri-urban settlements. *Child Youth ...* [Internet]. 2016 [cited 2017 Jul 6]; Available from <http://www.tandfonline.com/doi/abs/10.1080/17450128.2016.1214770>
18. Potterton J, Stewart A, Cooper P, Becker P. (2010). The effect of a basic home stimulation programme on the development of young children infected with HIV. *Developmental Medicine & Child Neurology*. June 1 [cited 2017 Oct 6];52(6):547–51. Available from: <http://doi.wiley.com/10.1111/j.1469-8749.2009.03534.x>
19. Gowani S, Yousafzai A, Armstrong R. Cost-effectiveness of responsive stimulation and nutrition interventions on early child development outcomes in Pakistan. *Ann New* [Internet]. 2014 [cited 2017 Jul 6]; Available from <http://onlinelibrary.wiley.com/doi/10.1111/nyas.12367/full>
20. Hemming K, Girling AJ, Sitch AJ, Marsh J, Lilford RJ, Franklin B. Sample size calculations for cluster randomized controlled trials with a fixed number of clusters. *BMC Med Res Methodol* 2011 111 [Internet]. 2011 Jun 30 [cited 2017 Aug 23];20(1):341–9. Available from: <https://bmcmedresmethodol.biomedcentral.com/articles/10.1186/1471-2288-11-102>
21. Mukuria A, Martin S, Egondi T. (2016). Role of social support in improving infant feeding practices in Western Kenya: A quasi-experimental study. *Health Science*. [cited 2017 Jul 6]; Available from <http://www.ghspjournal.org/content/4/1/55.abstract>.
22. Walker S, Powell C, Chang S, Baker-Henningham H, Grantham-Mcgregor S, Vera-Hernández M, Lopez-Bóo F. (2015). Delivering parenting interventions through health services in the Caribbean: Impact, Acceptability and Costs. IDB Working Paper Series; 642 ER -
23. Wertli MM, Schöb M, Brunner F and Steurer J. (2013). Incomplete Reporting of Baseline Characteristics in Clinical Trials: An Analysis of Randomized Controlled Trials and Systematic Reviews Involving Patients with Chronic Low Back Pain. *PLoS One*. 8(3).
24. Fujishiro K, Xu J, Gong F. (2010). What does “occupation” represent as an indicator of socioeconomic status? Exploring occupational prestige and health. *Social Science and Medicine Journal*;71(12):2100–7. Available from: <http://dx.doi.org/10.1016/j.socscimed.2010.09.026>
25. Miller LC, Joshi N, Lohani M, Rogers B, Mahato S, Ghosh S, et al. Women’s education level amplifies the effects of a livelihoods-based intervention on household wealth, child diet, and child growth in rural Nepal. *Int J Equity Health*. 2017;16(1):1–17.

26. Chorongo D, Okinda FM, Kariuki EJ, Mulewa E, Ibinda F, Muhula S, et al. Factors influencing the utilization of focused antenatal care services in Malindi and Magarini sub-counties of Kilifi county, Kenya. *Pan Afr Med J.* 2016;25(Supp 2):14.
27. Holding P, Abubakar A, Baar A Van, Obiero E. Validation of the Infant-Toddler HOME Inventory among households in low-income communities at the Kenyan Coast. 2011 [cited 2017 Jul 13]; Available from: <http://eprints.IANCS.ac.uk/id/eprint/72243>
28. Chang S, Grantham-McGregor S, Powell C. Integrating a parenting intervention with routine primary health care: a cluster randomized trial. *Pediatrics* [Internet]. 2015 [cited 2017 Jul 6]; Available from <http://pediatrics.aappublications.org/content/136/2/272.short>
29. Rahman A, Iqbal Z, Roberts C. Cluster randomized trial of a parent-based intervention to support the early development of children in a low-income country. *Child care, Heal* [Internet]. 2009 [cited 2017 Jul 26]; Available from: <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2214.2008.00897.x/full>.

## Appendices

### Appendix 1. Distribution of facilities per arm

Control	Ward	HF-based	Ward	HF + Home-based	Ward
Ndeda	Central Sakwa	Ouya Dispensary	South Sakwa	Mawere	North Sakwa
Serawongo	Central Sakwa	Ogam Dispensary	Yimbo East	Radier	East Yimbo
Kambajo	West Sakwa	Anyuongi	South Sakwa	Othach	West Yimbo
Kapiyo	West Sakwa	Nyaguda	South Sakwa	Nyanye Misori	West Yimbo
Uyawi	Central Sakwa	Mageta	West Yimbo	Gobei	North Sakwa
Oyamo	Central Sakwa	Usigu	Yimbo East	Got Agulu	West Yimbo

### Appendix 2. Primary caregivers recruited per facility

Arm 1	Pop. size	# Recruited	HF-based	Pop. size	# Recruited	HF + Home-based	Pop. size	# Recruited
Ndeda	1836	35	Ouya Disp.	2157	21	Mawere	4290	37
Serawongo	4237	37	Ogam Disp.	3648	23	Radier	2045	25
Kambajo	4793	59	Anyuongi	2541	42	Othach	3116	37
Kapiyo	5017	55	Nyaguda	6441	44	Nyanye Misori	4650	56
Uyawi	11179	75	Mageta	7360	79	Gobei	6726	52
Oyamo	1506	10	Usigu	8513	51	Got Agulu	16668	54
<b>Total</b>		<b>271</b>			<b>260</b>			<b>261</b>

### Appendix 3. Measure of knowledge and attitudes

Caregivers' knowledge and attitudes were measured through questions related to breastfeeding, early stimulation, learning, and health visits. Some of the items that we used emanate from a measure of child stimulation within the home environment, that has been culturally adapted and validated (the tool demonstrated a modest internal consistency, with an alpha of 0.63) for use among infants in rural Kenya (27), while other items are from an earlier study conducted in Jamaica (28) and Pakistan (29). The items from the Kenyan study were administered in a conversational manner, in an interview with the child's caregiver. We used 9 items to measure the knowledge of caregivers. All answers to the 9 items were measured on a 3-point scale (1= Agree; 2 = Not Sure; 3 = Disagree). All the items except 3, 5 and 9 were reverse-coded such that a higher ranking denoted better agreement. We generated the mean responses of primary caregivers to each of the items. Below are the 9 questions related to caregivers' knowledge and attitudes.

The questions were phrased as follows:

	Questions
Q1	Telling your child the name of an object for e.g. food, names of family member will help him/her to learn
Q2	It is important to caress or kiss a child at least once in a day
Q3	A parent needs to spank or beat young children when they are rude or they will grow up to be rude
Q4	It is important to take the child to the clinic for health check-up and regularly
Q5	There is no need to give toys to children who are aged one year and below
Q6	It is important for a caregiver or other people to keep a child in visual range at all times
Q7	It is important for a child to eat food with both parents at least once a day
Q8	Talking to a child when carrying out household activities is important for their development
Q9	Young children should not be held when they cry because this will make them want to be held all the time

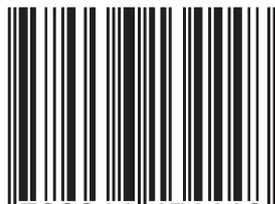








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