Qualitative Evaluation of the "Nurturing Care for ECD" Pilot Initiative in Monapo District, Mozambique

Joshua Jeong, ScD, Lilia Bliznashka, PhD, Marilyn N. Ahun, PhDc

Harvard T.H. Chan School of Public Health, Boston, USA

23 June 2021

HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

TABLE OF CONTENTS

ACKNOWLEDGEMENTS

We are grateful for the collaboration and support received from PATH in carrying out this research. Specifically, we thank Svetlana Karuskina-Drivdale, Melanie Picolo, Judite Pinto, Tanya Lalwani, and Matthew Frey at PATH for their contributions to this study and inputs in shaping the contents of this report. We thank Daan Velthausz and Rotafina Donco and the research assistants at Maraxis for their role in data collection, transcription, and translation. We also thank Aisha K. Yousafzai for her inputs throughout the evaluation and for this report. Finally, we thank the participants for their time and willingness to share their experiences with us. The study received funding from PATH through a grant from UNICEF and the Conrad N. Hilton Foundation. UNICEF and the Conrad N. Hilton Foundation had no role in the study design, data collection and analysis, or preparation of the report.

EXECUTIVE SUMMARY

In Mozambique, approximately half of preschool aged children are at risk of poor cognitive and socioemotional development, and 43% of children under aged 5 are chronically malnourished. "Nurturing care" – encompassing good health, adequate nutrition, safety and security, responsive caregiving, and opportunities for early learning – is critical to promoting healthy early childhood development. Health systems have unique opportunities and potential for delivering nurturing care interventions particularly for children during the first years of life. However, few interventions to date have leveraged health systems in low- and middle-income countries (LMICs) to promote early child development (ECD).

In this study, we evaluated the implementation of a pilot initiative to improve the health, nutrition, and development of children aged 0-3 years in three health facility catchment areas in Monapo district, Nampula province, Mozambique. The pilot initiative is a collective action model that focuses on enhancing existing health facility and community-based platforms of government and partners with nurturing care interventions. Partners included ICAP, FHI 360, Pathfinder, and other community organizations. The implementation of the pilot initiative began roll out in Q3, 2018 in a non-controlled real-world setting, and in a phased manner with iterative enhancements aimed at achieving health system acceptability, quality, integration and maintenance. The primary objectives of this Initiative were to: (1) increase children's access to quality nurturing care interventions – specifically, developmental monitoring and counseling on early learning and nutrition – through integration into existing government-led and partner-supported health services; (2) strengthen caregiver practices pertaining to early learning, responsive caregiving, and nutrition; ultimately contributing to improved development and nutrition outcomes for children during the first three years of life.

Using training packages developed by the Ministry of Health with technical support from PATH, UNICEF, WHO and other partners, various health facility providers and community actors were trained to increase awareness of ECD, monitor age-appropriate developmental milestones as a part of growth monitoring, and provide counseling on nurturing care as part of their existing work. To complement interpersonal communication activities, video screenings and radio listening sessions on nurturing care were facilitated at health facility and community level. Moreover, program efforts included support to strengthen the broader health system with supportive guidelines, job-aids, trainings and quality improvement efforts for delivering nurturing care as part of routine health services. Finally, broader efforts were made to advocate for nurturing care integration at the district-level to ensure relevant activities were integrated into annual district health plans during the implementation period and that implementation was Government-led. It is important to note that this study was conducted in the context of the COVID-19 pandemic, which caused a temporary suspension to most program services and results in other program modifications (e.g., discontinuation of playbox corners in health facility waiting rooms) to minimize COVID-19 risk transmission.

To evaluate this pilot program, we conducted a qualitative implementation evaluation study in October-November 2020 to capture the diverse experiences of caregivers, health facility providers, community providers, and program and district stakeholders over the past broad pilot implementation period. We specifically addressed four research questions:

1. How, if at all, have stakeholders, providers, and caregivers engaged with the intervention?
2. What is the acceptability of the intervention among stakeholders, providers, and caregivers?
3. What, if any, barriers and facilitators do stakeholders, providers, and caregivers face in implementing or engaging in the intervention?
4. What, if any, changes do stakeholders, providers, and caregivers perceive as a result of the intervention (i.e., for the health system as well as among providers and caregivers)?

In total, a local research firm (Maraxis) conducted 73 individual interviews with caregivers who had recently attended a health facility for their children younger than aged 2.5 years, health facility providers (e.g., MCH nurses, well-child consultation technicians, sick-child consultation providers, director of the health facility), community-based providers (APEs, AMASI and ADEMO activists), PATH implementation team members, district MoH representatives (e.g., chief medical officer, nutrition focal person, APE coordinator, MCH district lead), and non-government stakeholders (e.g., UNICEF health and nutrition specialist). They also conducted 3 observations at each of the three health facilities.

Our analysis revealed that the program successfully increased various stakeholders' capacities, strengthened existing systems and enhanced partnerships and collaborations to promote ECD. We found that it was feasible for providers to deliver nurturing care messages on nutrition, breastfeeding, child dietary diversity, maternal and child health, age-appropriate developmental milestones, stimulation practices, and father involvement. Caregivers similarly reported receiving information about multiple nurturing care messages. Importantly, intervention delivery was resilient to the COVID-19 pandemic, with facility- and community-based health services successfully adapting to and continuing to promote nurturing care during the pandemic.

With respect to acceptability, our findings indicate that the intervention was well accepted by all respondents. Specifically, providers were satisfied with the training, supervision, and program materials they received. Other stakeholders expressed satisfaction with the improved coordination and collaboration among various partners and the newly introduced emphasis on ECD messages. Caregivers were also satisfied with the nutrition and parenting messages and highlighted the positive interpersonal counselling received at health facilities. At the same time, we found variability in the degree to which different providers promoted specifically ECD messages, with facility-based providers more frequently reporting how they covered developmental monitoring and stimulation than community-based providers.

In terms of barriers, all respondents highlighted how lack of resources (e.g., financial, material, structural) was a cross-cutting barrier affecting the health system, providers' capacities and motivation, and caregivers' practices. Several caregivers and providers highlighted language barriers as affecting fluency of communication between caregivers and some health facility providers, who only spoke Portuguese and not also the local language. System-level barriers were also mentioned, ranging from long distances between households and the health facility, limited number of health facility and community providers, high staff turnover, limited time availability, high patient volume, and challenges in coordination between facility- and community-based providers.

With respect to facilitating factors, caregivers found the consistency and reinforcement of messages across multiple channels (e.g., health facility and community providers, counseling and media) as beneficial and appreciated messages which did not require financial resources to implement (e.g., making toys from household objects). Providers generally agreed that the training, supervision, and materials they received prepared them for the job. Stakeholders highlighted the district government's strong leadership and commitment as a key facilitator.

In terms of perceived changes, district stakeholders and providers highlighted benefits to the health system. This included increased awareness of nurturing care and ECD among facility- and community-based providers, enhanced providers' capacities and skills to support nurturing care, greater support and supervision received by providers, more efficient service delivery and operations, increased referrals processes and identification of children at risk. Stakeholders emphasized how the intervention enhanced district and provincial level partnerships to prioritize ECD services. Perceived changes among providers included increased knowledge about ECD, awareness of the linkages between nutrition and ECD, and screening of developmental delays and malnutrition. However, we found notable variation between health facility and community providers, with facility-based providers more clearly describing their engagement in nurturing care service delivery than community-based providers. Finally, all respondents perceived intervention benefits for caregivers as well, such as increased caregiver participation in child health services, caregiver awareness of ECD, and nurturing care behaviors. While child health and nutrition messages were referred to by the caregivers relatively more frequently than ECD messages, several caregivers particularly underscored enjoying messages about homemade toys and messages about talking to the baby while in the womb.

It is worth reiterating how the COVID pandemic disrupted health services in Monapo and led to several modifications to the original pilot model, such as the COVID-19 risk prevention and education messages as part of all service delivery channels, lower intensity of service delivery and utilization, as well as modified supervision and technical assistance structures. Nevertheless, we found that health facility and community providers were able to successfully adapt much of the pre-pandemic services at both health facilities and the community and continue implementation of nurturing care services with fidelity, acceptability, and various perceived benefits.

Overall, our study extends the growing body of evidence on nurturing care interventions, and specifically those that have integrated parenting and nutrition within existing health systems. To date, the majority of prior programs have focused specifically on delivery through a single cadre or context for promoting nurturing care: either exclusively at health facilities or entirely in the community. In contrast, this pilot is one of the first to utilize existing structures across both health facility and community platforms and coordinate across multiple providers/actors within the district health sector through a collective action model to deliver a concerted package of nurturing care services for all young children in the Monapo district, Mozambique.

Based on our findings, we offer several considerations for enhancing future programming. First, counselling from health facility providers appeared to be more influential for promoting nurturing care information than via media or posters. We identified several logistical constraints or implementation issues relating to irregular broadcast schedules and less optimal placement of TVs and radios at the health facilities. Strengthening the integration of counseling alongside the use of

media may increase exposure and enhance complementarity to reinforce key messages. Second, considering the identified health systems resource constraints (e.g., limited staff, high staff turnover, variable provider motivation levels), greater investments to mobilize and train lay workers through coordination with the MoH system can be a possible interim strategy for increasing the delivery of nurturing care services while the government builds capacity and trains sufficient human resources for health care. Third, providers as well as caregivers primarily described program content on ECD as focused on developmental monitoring, preventing developmental delays among children at-risk, and toy making. In contrast, promotion of age-appropriate stimulation activities (i.e., play, learning, communication) and support for enriched parent-child interactions were relatively less frequently discussed by caregivers and providers. This can be partially explained by MoH focus to improve reporting on developmental delays, which are new indicators recently added at healthy and sick child consultations, and the lack of additional indicators pertaining to early learning, responsive care, or other basic ECD milestones. Considering evidence that has suggested parenting interventions with responsive caregiving components are more effective than those that do not address responsive caregiving, future research is needed to understand how to operationalize and design content to promote responsive caregiving in the local context of Monapo, Mozambique and the feasibility of incorporating such messages within health systems. Finally, our results highlight the need for testing and potentially utilizing more behavior change techniques across service platforms – beyond information sharing, counseling, and media alone – by incorporating interactive activities/role plays, demonstrations, problem solving, peer learning, and social support. Group-based education talks at the health facility and in the community were largely eliminated or reduced at the time of this study to comply with COVID-19 risk mitigation measures. Future efforts should explore the extent to which this delivery approach could be feasibly reintroduced in the study context given the benefits of peer/social learning, reflections and discussions, and prior literature that has shown that group-based nurturing care models are more cost-effective and have greater economies of scale than individualized strategies.

Several limitations to this study are worth highlighting. First, our qualitative study relied on self-report that reflect individuals' perceptions and are also potentially subject to social desirability bias. Therefore, all findings should be interpreted with caution. Second, for the sampled caregivers, we recruited those who had visited the health center in the past month. We did not also purposefully select caregivers who had interacted with community actors supported as part of the Initiative. Therefore, we are unable to adequately evaluate caregivers' experiences with and the implementation of community-based services, and in particular those caregivers who may have received targeted or indicated support for nurturing care from AMASI and ADEMO, respectively (all tiers of the service pyramid). Third, this study occurred during the COVID-19 pandemic and data were collected several months after a temporary pause to intervention components and program modification to mitigate COVID-19 risk transmission. While results generally showed that the pilot was resilient and demonstrated feasibility in light of the COVID-19 pandemic, results may be limited to this particular period in time and not generalizable. Finally, given that the intervention was embedded within existing health services and encompassed the reinforcement of existing services and introduction of new services, it was challenging for both caregivers and providers to disentangle individual intervention components, specifically those supported by this pilot nurturing care initiative.

Overall, our results provide preliminary evidence to support the feasibility, acceptability, and various perceived benefits of integrating nurturing care within existing health facility and community-based services. Following the promising trends from this qualitative evaluation, and once needed improvements to delivery models are set in place, a rigorous quantitative implementation and impact evaluation should be conducted to assess the extent to which the pilot is being implemented as designed and the population is receiving the intended dose of services; and to determine the range of effects attributable to this collective action model for nurturing care on health system, caregiver, and child outcomes. Additionally, a costing analysis can be valuable for decision-making and guiding any future next steps. Taken together, these additional and complementary types of external evaluations should be coupled alongside continuing program implementation to provide a further evidence about the extent to this intervention model can be taken-up and implemented by the government, with quality, impact, potential for sustainably, and at scale. Ultimately, large-scale, government-led, high-quality ECD systems are needed to reduce inequities in nurturing care and ECD and ensure that all children at a population-level can reach their developmental potential.

INTRODUCTION

There are 250 million (~43%) children under 5 years at risk of not attaining their developmental potential due to a host of risk factors including poverty, malnutrition, infectious diseases, and suboptimal parenting practices (Lu, Black, & Richter, 2016). The regional burden of poor early child development (ECD) is the greatest in sub-Saharan Africa, where 66% of children are at risk (Lu et al., 2016). In Mozambique, an estimated 52% of 3- and 4-year old children are failing to attain basic milestones of cognitive and socioemotional development (McCoy et al., 2016), and 43% of children under 5 are chronically malnourished (Ministerio da Saude, Instituto Nacional de Estatística, & ICF International, 2011). Early interventions are needed to enhance children's experiences and environments and promote children's acquisition of developmental skills which set the foundation for later health, learning, and wellbeing outcomes over the life course (Gertler et al., 2014; Walker, Chang, Vera-Hernandez, & Grantham-McGregor, 2011).

Globally, the majority of interventions for children during the first few years of life have been health or nutrition interventions, which have shown effectiveness for reducing child morbidity and malnutrition (Gilmore & McAuliffe, 2013; Lassi, Das, Zahid, Imdad, & Bhutta, 2013). With an increasing global knowledge base and a shift in global priorities towards ensuring that children not only survive but also thrive, there has been strong interest in implementing early interventions for improving children's cognitive, language, motor, socioemotional, and behavioral development outcomes (Engle et al., 2011). However, evidence consistently suggests that health and nutrition interventions alone have small, if any impacts, on ECD outcomes (Gladstone et al., 2019; Prado et al., 2019; Taneja et al., 2020). Instead, intervention components that increase parental engagement in early learning activities (e.g., play, communication) and strengthen responsive parent-child interactions are needed to meaningfully improve ECD (Britto et al., 2017). A recent meta-analysis has shown significant benefits of parenting interventions on early child cognitive, language, motor, socioemotional, and behavioral development outcomes as well as on maternal knowledge of ECD, stimulation practices, and responsive parent-child interactions (Jeong, Franchett, Ramos de Oliveira, Rehmani, & Yousafzai, 2021).

The *Nurturing Care Framework* highlights five domains of "nurturing care" (i.e., good health, adequate nutrition, safety and security, responsive caregiving, and opportunities for early learning) that are interlinked and should be addressed in interventions to holistically ensure that children reach their full developmental potential (Black et al., 2017; World Health Organization, United Nations Children's Fund, & World Bank Group, 2018). In particular, the *Nurturing Care Framework* underscores the unique opportunities for delivering nurturing care interventions for ECD (e.g., integrating nutrition and parenting support) as part of routine child health service delivery (World Health Organization, 2019). Some of the advantages of leveraging the health systems to deliver nurturing care interventions include: (1) health systems have existing platforms, staff, resources, and ongoing service delivery that already reach young children and their caregivers in LMICs, (2) health systems involve multiple contact points (e.g., well-child and sick-child visits), targeted strategies and services (e.g., malnourished children, children with disabilities), and contexts (e.g., outpatient, inpatient, home visits, mobile brigades) for service delivery and population coverage, and (3) health systems have the leadership and partnerships with other stakeholders in the community and sectors to catalyze multisectoral and multilevel

collaborations to support young children, caregivers, and families (Milner et al., 2019; World Health Organization, 2019).

However, few interventions to date have integrated and delivered parenting support for ECD (i.e., responsive caregiving and opportunities for early learning) as part of existing services and systems in LMICs. Below are four noteworthy examples. First, in a trial across 90 clinics in Bangladesh, government health care providers integrated counseling on play and communication activities as part of routine services for underweight children at community health clinics (Hamadani et al., 2019). Results indicated that the intervention had large effects on children's cognitive, language, motor, and behavioral development outcomes, but no impacts on children's growth outcomes. Second, in trial across 80 health catchment areas in rural Pakistan, Lady Health Workers integrated parenting and nutrition support into routine home visits as part of the primary health care services for young children (Yousafzai, Rasheed, Rizvi, Armstrong, & Bhutta, 2014). Lady Health Workers delivered a responsive stimulation intervention (focused on improving quality of mother-child interactions and stimulation activities) and an enhanced nutrition intervention (i.e., nutrition counseling and multiple micronutrient powders) either separately or in combination. Results showed that the responsive stimulation intervention had medium-to-large effects on children's cognitive, language, and motor development. Neither the responsive stimulation nor enhanced nutrition interventions improved child growth outcomes. Third, as part of routine well-child visits across 30 primary health centers in three Caribbean countries, community health workers used videos to model and discuss early stimulation messages with mothers in the waiting areas. Nurses further reinforced counseling about stimulation as part of consultation sessions (Chang et al., 2015). Results showed small benefits to child cognitive development, but no benefits to child language, motor, or growth outcomes. Finally, as part of a large-scale, government nutrition program across 125 catchment areas in Madagascar, enhanced nutrition services (e.g., intensive counseling, lipid-based nutrient supplementation) and the combination of nutrition and early stimulation counseling were delivered through home visits by community health workers (Galasso, Weber, Stewart, Ratsifandrihamanana, & Fernald, 2019). There were no effects observed for any of the interventions on child development or growth.

While all these examples similarly leveraged existing government systems, substantial variation can be seen in these program implementation models. In fact, implementation challenges – such as insufficient program intensity, low take-up by beneficiaries, lack of coordination of services, and weak governance or political will – have been identified as the key reasons why some nurturing care interventions have been less effective than others for improving caregiving and ECD outcomes (Britto, Singh, Dua, Kaur, & Yousafzai, 2018; Galasso et al., 2019). However, there is limited programmatic guidance regarding how best to optimize the delivery of nurturing care interventions through existing platforms and services, which will certainly vary and depend to some degree upon the context. As a result, there is a great need for research that documents, unpacks, and evaluates implementation processes and strategies of specific nurturing care interventions, especially during early-stage pilots to assess initial feasibility and potential of a program model and inform further refinements to increase effectiveness, coverage, scale, and sustainability (Richter et al., 2017). Additionally, understanding the perceptions of stakeholders and partners in the study context (e.g., district/province level) and aspects of local leadership and political will to advance the agenda towards promoting ECD is another critical piece to assessing program implementation, environment, and potential for scale.

Objectives and Research Questions

To begin to address this evidence gap, the overall objective of this study was to evaluate the implementation of a multicomponent, multilevel pilot intervention focused on promoting nurturing care for ECD within existing health facility and community health services in three health facility catchment areas in Monapo district in rural Mozambique. We draw on the diverse experiences of caregivers, health facility providers, community providers, and program and district stakeholders to answer the following four research questions:

1. *How, if at all, have stakeholders, providers, and caregivers engaged with the intervention?*
2. *What is the acceptability of the intervention among stakeholders, providers, and caregivers?*
3. *What, if any, barriers and facilitators do stakeholders, providers, and caregivers face in implementing or engaging in the intervention?*
4. *What, if any, changes do stakeholders, providers, and caregivers perceive as a result of the intervention (i.e., for the health system as well as among providers and caregivers)?*

It is worth noting that this study was conducted in October-November 2020, particularly during the context of the COVID-19 pandemic that inevitably resulted in reduced services, particularly at the level of community platforms, and in challenges to the health system and to care-seeking behaviors by families and communities. Nevertheless, this study sheds light on lessons learned over the past two years of program introduction, sensitization, coordination, training, and service delivery at these three pilot health facilities catchment areas in Monapo district and provides recommendations for future programming.

METHODS

Background Context

Historically, the Mozambican Ministry of Health's standard of care for young children has focused exclusively on health and nutrition, without support for parenting such as the promotion of responsive care and early learning for healthy ECD. PATH, a global nongovernmental organization working on maternal and child health and nutrition, initiated work in Mozambique in 2012 in Maputo Province to introduce attention to child development. Since then, PATH and partners have been advocating at the national and sub-national levels for the inclusion of missing nurturing care[1] components in all health service points catering to young children and their families. By 2018, PATH, UNICEF and WHO collectively contributed to the following achievements at the national level, which prepared the ground for the Monapo Nurturing Care pilot:

- Developmental monitoring[2] and counselling integrated into Well Baby and Child-at-Risk consultation guidelines, and into IMCI flipchart in use at Sick Child services
- Indicator on number of children with developmental delays integrated into well baby and sick child consultation registers
- Posters on developmental milestones and play and communication activities based on Care for Child Development approved and distributed for national use in MCH consultations
- Developmental stimulation[3] reinforced as a part of national nutrition rehabilitation program
- Approval obtained for integration of developmental monitoring and counseling into CHW (APE) package; initial content integrated into APE participant training manual.

Nurturing Care for ECD (NCfECD), Monapo Pilot Initiative

55% of children under 5 suffer from chronic malnutrition in Nampula province[4], which is strongly linked to compromised development. Monapo district has the presence of many partners working to address malnutrition and child health, which offers a productive ground for integrating responsive care and early learning services to improve child development. In Q3 of 2018, PATH, UNICEF, ICAP, FHI 360 (COVida and Alcançar projects), ADEMO (local disability NGO) and h2n (local communications NGO) and others came together with the government to implement the Nurturing Care for ECD (NCfECD) pilot initiative in Monapo district in Nampula province. Additionally, UNICEF provided direct support to the provincial and districts health services to reinforce facility and community ECD services. Three primary health facilities in Monapo district (Monapo, Monapo Rio and Carapira) and their community catchment areas with strong partner support were prioritized to receive more intensive technical assistance from PATH.

[1] Nurturing care includes five components: good health, adequate nutrition, responsive caregiving, security and safety and opportunities for early learning.
[2] Developmental monitoring in these primary care services refers to verifying the achievement of specific age-appropriate developmental milestones by the child.
[3] Stimulation refers to responsive care, play and communication activities provided by the caregiver to support child's development.
[4] DHS 2011.

The NCfECD pilot initiative (henceforth referred to as the Initiative), funded by the Conrad N. Hilton Foundation and UNICEF, is a collective action model that focuses on enhancing existing health facility and community-based platforms with nurturing care interventions, through collaboration with government and partners. For example, while government led integration into routine MCH and community health platforms, partners like ICAP and FHI360/COVida reinforced developmental monitoring and counseling as a part of HIV and OVC services, respectively. The implementation occurred in a non-controlled real-world setting, and in a phased manner with iterative enhancements aimed at achieving health system acceptability, quality, integration and maintenance. The primary objectives of this Initiative were to: (1) increase children's access to quality nurturing care interventions – specifically, developmental monitoring and counseling for responsive caregiving, early learning and nutrition – through integration into existing government-led and partner-supported health services; (2) strengthen caregiver practices pertaining to early learning, responsive caregiving, and nutrition; ultimately contributing to improved development and nutrition outcomes for children during the first three years of life. The following section described in more details the core components and actors involved in the pilot initiative, beginning with PATH and followed by the health facility and community-based actors and services.

Components of the pilot initiative

Health-facility based intervention components

At the health facility level, services are delivered by a cadre of providers at government primary health care centers under the purview of the MoH. Provincial and district MoH and partner trainers, and subsequently service providers, were trained on integrating developmental and nutritional monitoring and counseling on early learning and nutrition antenatal and postnatal care, healthy, sick and child at risk consultations, and waiting room activities. Responsive care was reinforced later in the pilot, by training providers to interact responsively with children and be role models for the caregivers. Any government tools that already integrated developmental monitoring or counseling (e.g., IMCI flipchart) were reinforced for use.

Posters on developmental milestones, play activities and complementary feeding developed by PATH and endorsed by the MoH were placed in waiting rooms and consultation rooms to aid service provision and increase exposure and encourage behavior change. Prior to COVID-19, locally made play materials and books for young children were also made available through playbox sessions in the waiting rooms and pediatric wards. However, this component was paused in April 2020 to minimize COVID-19 risk transmission. In two of the three prioritized health facilities that have electricity, locally produced dramatized videos on child development and nutrition were screened on the TV placed in the waiting area. Use of radio content (e.g., children's songs and humoristic radio skits on early learning and nutrition) in the waiting rooms in particular were enhanced in summer 2020 as a safe and viable platform for amplifying nurturing care and COVID-19 prevention messages, with all district health facilities receiving a radio and the content to broadcast. Most radio content was in the local language, except for some COVID-19 messages that were nationally developed and were in Portuguese. The radio and video sessions are supported by lay staff or clinical providers such as nutritionists.

In addition to primary health care providers and non-clinical / lay workers, the pilot also engaged medical doctors and specialists such as physiotherapists and clinical psychologists. These providers supported rehabilitation of children with developmental delays and disabilities, as well as outreach brigades to families of these children.

Community-based intervention components

At the community-level, various community actors such as government CHWs (APEs), activists, and selected Traditional Birth Attendants and Community Health Committees were trained on developmental monitoring, nutrition screening, and counseling on early learning and infant and young child feeding as part of their routine services for caregivers with young children. Of these, APEs, ADEMO and AMASI activists have more clearly delineated roles, receive monthly subsidies, and regularly implement and report to their supervisors on community activities. Therefore, these three cadres of community providers were prioritized for this evaluation.

APEs have primary education, on average, and most are perceived to have low literacy and technical and work management skills overall. Internal data collected prior to the pilot indicated that APEs delivered minimal interventions on nutrition and no ECD-related interventions. APEs have inconsistent and generally low coverage of families, reaching an average of 30 families per month, according to routine service data, and conducting one-off group tasks. There are no clearly defined targets, and CHWs are unlikely to come back to the same family unless the child is a newborn or is sick. In 2019, the APEs began implementing a national growth monitoring program called PIN, regularly bringing together all families with children under 2 years. Playing and talking with young children is part of PIN counseling package, which PATH helped design. In 2020 due to COVID restrictions, PIN sessions became less frequent, and the number of participants was reduced from approximately 50 to 10.

AMASI activists visit close to 20 families per month, every 2 weeks for about 6 months on average, and offer counseling and referrals related to minimal package of services defined by government for OVCs, as a part of COVida project. Developmental monitoring and counseling was integrated into COVida services and tools already in 2016, when PATH was a TA provider on COVida. Therefore PATH merely reinforced these components during Monapo pilot.

Finally, as part of this Initiative, ADEMO activists have been trained and are supported by PATH to conduct early identification, referrals, counseling on nutrition and stigma, and community-based rehabilitation of children under 5 with developmental delays and disabilities. Each activist supports 10 children by visiting them every 2 weeks until they "graduate" due to improvement or age.

In addition, radio was used to transmit messages in the communities in the catchment areas of priority health facilities. ADEMO activists and APEs received radios and nurturing care content to broadcast during home visits or to facilitate community group radio listening sessions, respectively. Finally, two mass media campaigns, one in the last quarter of 2019 and the other in late 2020 (October-December), were conducted by pilot partner h2n to broadcast district-wide dialogues and spots on early learning, nutrition, disability and on continuity of services during COVID-19 through community radios.

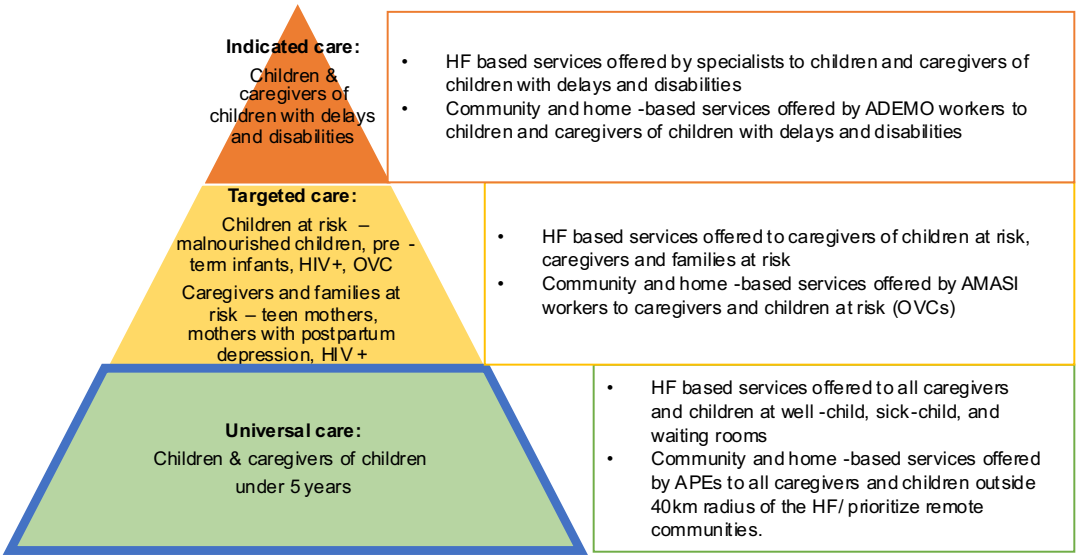
Links to the *Nurturing Care Framework*'s three levels of support to families

In the *Nurturing Care Framework*, it is suggested that three levels of services are made available to the families, which would respond to their specific needs. These are universal services (such as MCH consultations and routine CHW home visits to children in their area, for example), targeted services (for children or caregivers at risk of poor developmental outcomes) and indicated services (for children with confirmed disabilities, for example). Universal services by nature are light-touch and not intensive, but they reached the largest number of families.

In the NCfECD pilot, most health facility-based services were low intensity universal services that reinforced nurturing care for ECD through routine consultations and through radio and video sessions as caregivers came in contact with routine and emergency services (Figure 1). While several targeted services such child-at-risk consultations and inpatient pediatric wards also integrated ECD interventions, technical support focused on healthy and sick child services, as these had recently introduced indicators on developmental delays and the MoH was interested in PATH prioritizing these universal service touchpoints.

Similarly, CHW-delivered home visits and group talks can be characterized as universal low-intensity services as they do not target children at risk and APEs infrequently visit the same family more than twice; in turn, ADEMO and AMASI services can be characterized as targeted and indicated high intensity services, respectively, as these work with high-risk children through frequent individualized interventions. Finally, specialist outreach brigades also fall under indicated services.

Figure 1. Three levels of services provided to caregivers and young children in the pilot Initiative.



Role of PATH in NCfECD pilot initiative

PATH provided overall coordination of the partnership as well as technical trainings, resources, mentorship, and support for MoH and other partners to integrate and deliver nurturing care services as part of their ongoing health services to support caregivers and young children in Monapo. This support was provided by two PATH officers focused respectively on community and facility-level interventions and seated at district health services, and by a provincial coordinator. In addition to mobilization, technical oversight, and supervision, PATH played a leading role in advocating for nurturing care integration at district-level, to complement provincial- and national-level advocacy interventions, as described above. To enable this, a district nutritionist was appointed as the nurturing care for ECD focal point by the Monapo district health services to ensure relevant activities were integrated into annual district health plans during the implementation period and that implementation was Government-led.

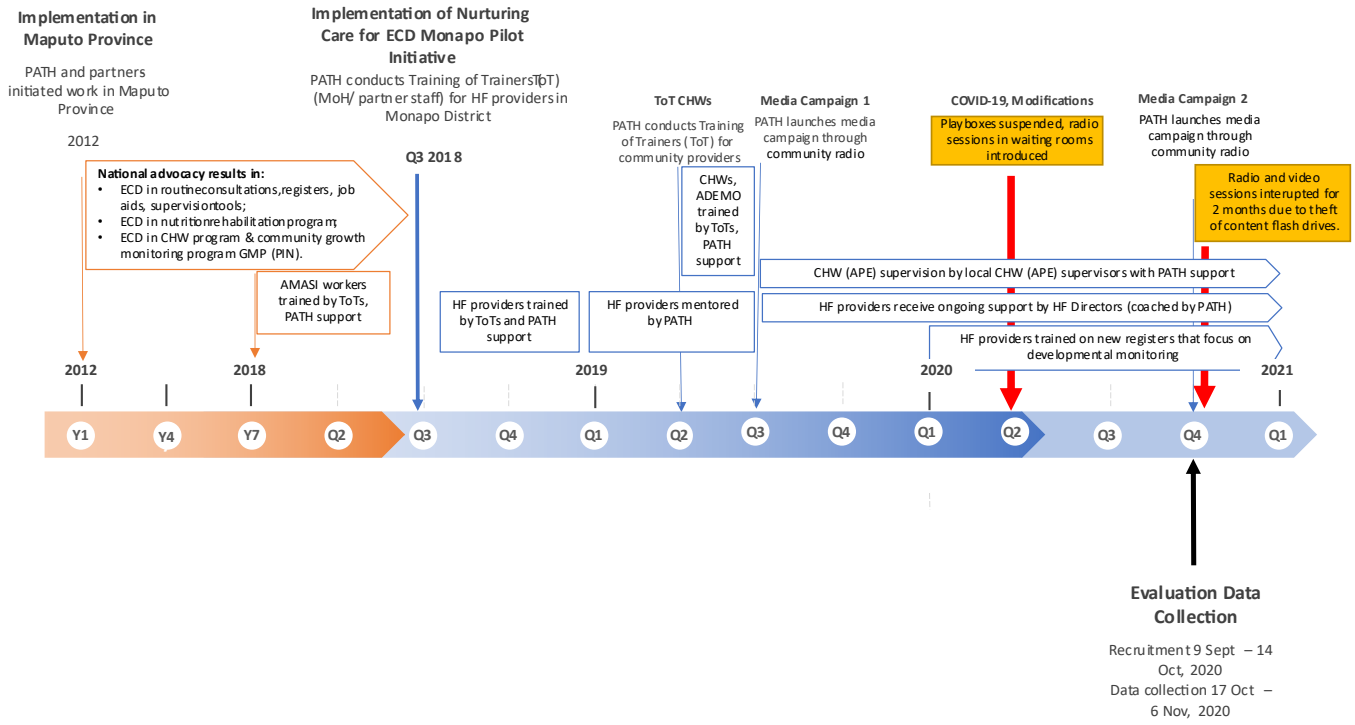
Trained facility providers initially were set to received three monthly mentoring sessions each, focused on observation and coaching; however, after a while such mentoring was not deemed viable due to high provider rotation. PATH transitioned to monthly technical assistance at health facilities, where relevant touchpoints would be supported regardless of the provider present on that day. In 2020, PATH increasingly began to support the three health facility clinical directors to provide technical support to their health workers, oversight of routine collection of ECD-related indicator, and most recently to support the quality of counseling. This became increasingly seen as a viable and sustainable strategy to ensure ongoing technical support to providers.

PATH began working extensively with the APE supervisory system in Monapo in early 2020, after identifying numerous weaknesses in supervisor knowledge and skills, and observing poor coverage and frequency of supervision activities in 2019. Specifically, in 2020 PATH jointly with APE district coordinator introduced quarterly data dashboard on APE and supervision productivity (including on ECD), which is analyzed with supervisors, and gaps are addressed through subsequent supervision and refresher trainings to APEs. Additionally, PATH supported monthly supervision of APEs in priority areas, focused on improving quality of home visits (using complementary tool provided by PATH) and on data records. AMASI and ADEMO were supported with in-service training and data monitoring through regular supervisor and activist meetings, and also received joint supervision while conducting visits to beneficiaries.

Program Timeline

Figure 2 shows a high-level overview of the implementation timeline of the various activities as part of the pilot initiative in Monapo district (also depicting prior PATH-supported ECD activities in Maputo and nationally). The pilot initiative in Monapo district was rolled-out in Q3, 2018 for a period of two years prior to the evaluation data collection in Oct 2020 (see Figure 2). At the end of 2018/early 2019, health facility-based services were supported first, and then community-based services in the year following.

Figure 2. Implementation of "Nurturing Care for ECD" Monapo Pilot Initiative and Evaluation Timeline.



The implementation roll-out was impeded by COVID-19 in April 2020, which continued to disrupt delivery of routine health services at the time of the evaluation.[5] In terms of the COVID-related modifications, the playbox component was paused in April 2020 to minimize COVID-19 risk transmission. Use of radio content (e.g., children's songs, stimulation and nutrition dialogues) in the waiting rooms in particular were enhanced in summer 2020 as a safe and viable platform for amplifying nurturing care and COVID-19 prevention messages.

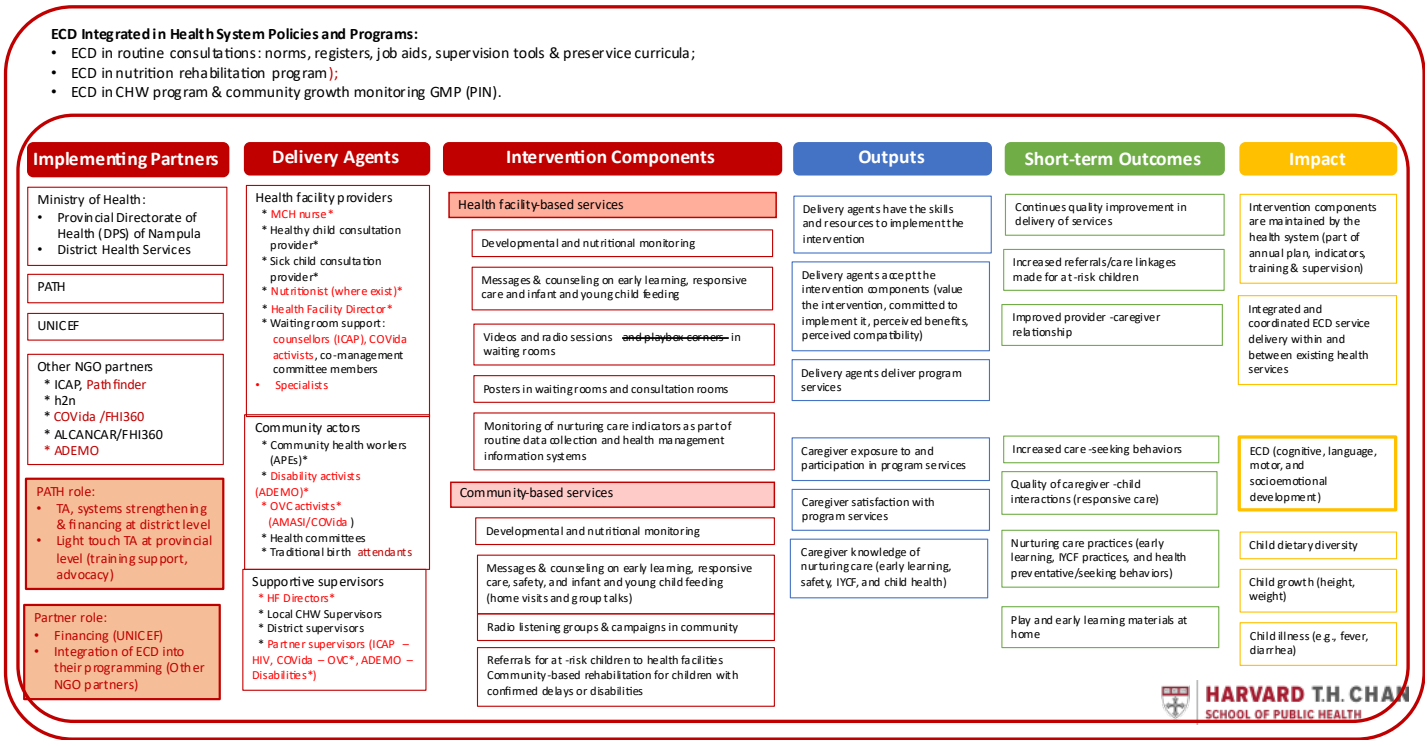
Theory of Change

The Theory of Change presents the expected chain of results for meeting the above-mentioned primary objectives (see Figure 3). Expected changes were hypothesized at both the health systems level, and at community/ caregiver level. At the health systems level, as a result of the trainings and technical support offered collectively by the implementing partners, the delivery agents are expected to have the knowledge, skills and resources to integrate NCfECD services as part of routine care. The resulting outcomes in the near term at the heath system level are quality improvement in the delivery of services, improved linkages between service touchpoints and tiers, and improved provider-caregiver interactions. At the caregiver level the caregivers are exposed to

[5] HMIS data on disruptions to routine services

a range of nurturing care services at each contact with a delivery agent, which is expected to improve their knowledge of NCfECD, and satisfaction with the services offered at the heath service touchpoints by the delivery agents. Near-term measurable outcomes among caregivers include increased care-seeking behaviors, improved quality of caregiver-child interactions, NC practices and presence of early learning materials in the home. Overall in the long term, the Initiative is expected to be maintained and integrated within the existing health system, and ultimately produce changes in caregiver NC behaviors and practices that will, in turn, positively benefit children's health, nutrition, and development outcomes.

Figure 3. "Nurturing Care for ECD" Pilot Initiative: Theory of Change.



Study design

We conducted a qualitative implementation evaluation study to assess the perceived delivery, acceptability, implementation barriers and enablers, and resulting changes of the pilot Initiative. We drew upon the diverse perspectives of various key informants through primarily conducting individual in-depth interviews. We additionally collected observational field notes from a series of three random visits at each of the three health facilities. As presented above in the overview of the pilot, a wide range of existing delivery agents and district and provincial organizations/partners were engaged over the past two years as part of this pilot to promote nurturing care for ECD at three priority health facilities and their community catchment areas. For this evaluation, we focus on nurturing care service delivery for caregivers and children attending *well child and sick child visits*; and community- and home-based services provided by specifically *APEs, AMASI, and ADEMO activists*. While providers and a supervisor for each of these health facility and

community providers were sampled in this evaluation, caregivers on the other hand were randomly sampled based on records of those who had visited the health facilities in the past month. Caregivers were not additionally sampled in a purposeful manner for having received care from a community provider (e.g., APE, AMASI, ADEMO). Therefore, while we are able to triangulate results between providers and caregivers to assess a broader perspective of implementation of the health facility-based program components, results for the community-based program components were only purposefully sampled for the relevant providers and largely represented the experiences of caregivers who sought care for a well-child or sick child visit, but not also caregivers who were confirmed as having received services from a community providers, and in particular those who may have received targeted or indicated support for nurturing care from AMASI and ADEMO, respectively.

Sampling

We used a combination of random and purposeful sampling to recruit a broad range of key informants: caregivers and providers, PATH program staff, and relevant district government and nongovernmental partners. Specifically, for the sampling of caregivers and providers, we stratified across the three health facility catchment areas that were prioritized for the pilot intervention to maximize variation and ensure a more balanced representation of experiences.

We recruited two groups of caregivers using two separate recruitment methods to address different aspects of the research question. The first group of caregivers were recruited to provide detailed information on all aspects of intervention implementation. A comprehensive semi-structured topic guide was used. To recruit these caregivers, we collaborated with each of the health facilities to prospectively compile a list of caregivers that attended the health facilities for a well-child or sick-child visit from 9 September to 14 October 2020. Using these lists, we randomly selected caregivers for recruitment based on the following inclusion criteria: caregiver is a primary caregiver who resides together in the same household as the child, caregiver lives within the geographic catchment area of the health facility, child is younger than 2.5 years of age, interview date is between two to four weeks following the last health facility visit date, and caregiver provides informed consent for study participation. Contact with specific community actors was not included as a criterion. We also did not specifically target children living with HIV or a disability, which could make them eligible for AMASI or ADEMO community services, respectively. We aimed to interview 4 mothers and 2 fathers in each health area for a total of 18 caregiver interviews. All caregiver interviews were scheduled in advance and conducted at the caregiver's home. Interviewer were conducted in the caregiver's preferred language (Portuguese or Makua). Interviews lasted between 1-2 hours.

The second group of caregivers were recruited upon leaving the health facility to understand in more depth the interpersonal counseling received and perceived relationship dynamics with providers during that health facility visit. To recruit these caregivers for health facility "exit interviews", we conducted three random visits to each health facility over the total three-week study data collection period and randomly enrolled 1 or 2 caregivers who had visited the health facility that day to receive care for their child. We used the same eligibility criteria, but without a time lag between interview and health facility visit date. Instead, all interviews were conducted on the same day of care in a private location outside the health facility using a semi-structured exit

interview topic guide. We planned to conduct 5 caregiver exit interviews at each health facility for a total of 15 interviews. Exit interviews were 30-60 minutes in duration.

Health facility providers and community-based providers were also interviewed. We prioritized the following providers for having a greater engagement with PATH and role/contact with caregivers of young children: for health facility providers, MCH nurses, well-child consultation (CCS) technicians, sick-child consultation (CCD) providers, and the director of the health facility; for community providers, APEs, AMASI and ADEMO activists. PATH provided a list of these facility and community providers working in each health facility catchment area. We aimed to sample 2 MCH nurses, 3 APEs, and 1 of each of the remaining providers per health facility catchment area. In areas where there were multiple providers for a given role, we randomly selected a respondent. Interviews with facility providers were done in a private location at the health center. Interviews with community providers were done at the preferred location of the community provider, which was most often at a central location in the community. The same semi-structured provider interview topic guide was used in all provider interviews. Interviews were between 1-2 hours in duration.

Finally, we conducted interviews with PATH program staff and district stakeholders. These individuals were purposefully selected in consultation with PATH for their roles and experience with the project. Relevant PATH staff included 2 district officers and 1 provincial coordinator involved in supporting the intervention implementation. District partners included individuals from the MoH – chief medical officer, nutrition focal person, APE coordinator, MCH district lead – and representatives from COVida, ADEMO, and UNICEF. The same semi-structured interview guide was used in all stakeholder interviews. With the exception of two virtual interviews, stakeholder interviews were conducted at a location preferred by the respondent.

Field data collection

Data collection was conducted by a team of 5 individuals at Maraxis with prior experience in qualitative research: 4 research assistants Isac Sualei, Daniel Sururi, Francisca Sande, Rotafina Donco (field supervisor), and Daan Velthausz, who supervised the team remotely and managed field data collection on a daily basis. Joshua Jeong at Harvard remotely oversaw overall study progress and communicated daily with Maraxis throughout data collection.

A five-day training took place from 12-16 October 2020 with the objectives of building understanding of ECD and nurturing care; the PATH pilot intervention; qualitative research methods and effective interviewing; ethical guidelines for conducting research with human subjects; COVID-19 risk prevention; evaluation study design and primary research questions; data collection process and procedures; and data collection tools and forms. The first two days (12-13 October) were held in Nampula City and consisted of classroom-based presentations from PATH and Harvard. The following 3 days (14-16 October) included field pilot exercises held at Itoculo Health Facility in Monapo district. The purpose of the pilot exercises was to build familiarity with the topic guides, make any necessary modification to tools, ensure feasibility and safety with respect to the protocol, and ensure appropriate probing and data quality before officially launching the study. After the pilot exercise, we made several edits to the tools to improve clarity of questions (e.g., additional probes, breaking out longer questions into separate questions to ensure keys topics

are all addressed). We also encouraged data collectors to provide reflection notes for each interview based on their experience. It also became clear that few fathers were pre-identified and the recruitment of fathers would be more time consuming than we had budgeted. Therefore, we went with a convenience sampling approach for any fathers that happened to be present at the health facility. Study data were collected from 17 October to 6 November 2020. All the interviews, except for three (the UNICEF representative, PATH Provincial Coordinator, and the MoH chief medical officer) were conducted in-person.

Although we had originally hoped to sample at least two fathers in each health facility catchment areas, the team was only able to successfully interview two fathers at home. It was rare for men to take their child to the hospital which made it challenging to identify fathers for recruitment. Moreover, most biological fathers of the household we visited either did not live with the child's biological mother or worked far from home such that they were not present or available. In addition to the two biological fathers, one uncle who identified himself as the primary male caregiver of the child was also interviewed. We also managed to interview a father for an exit interview at the heath facility. Because we sampled fewer fathers than originally planned, five additional interviews were conducted with mothers at home and one additional health facility exit interview was conducted with a mother.

At the time of data collection, there were no COVID-19 response measures enacted by the government at the regional or local levels, besides risk mitigation measures taken at health facilities (described in the final results section on program modifications due to COVID-19). All face-to-face interviews were conducted per a COVID-19 risk mitigation protocol: physical distancing of 6-feet apart, outdoor settings prioritized over indoor, provision and use of face masks for the data collectors and respondents, and use of hand sanitizers before and after all interviews. Interviews were audio-recorded, transcribed, and translated verbatim into English by the team of research assistants immediately after each interview was conducted and concurrently to the completion of fieldwork. During the first two weeks of data collection, the first author debriefed every day with the field research assistants via teleconference calls to discuss data collection progress and any logistical challenges encountered, any necessary refinements to the topic guides, and any emerging findings.

Interview transcription took place concurrently to data collection. Interview conducted in Makua were transcribed into Portuguese and translated into English. Interviews conducted in Portuguese where the interviewer was fluent in English were transcribed directly into English. The observation notes were directly recorded into English as they were conducted by two bilingual research assistants. All English transcripts were fully completed by 25 November 2020.

Data analysis

Data were analyzed using thematic content analysis (Schreier, 2014). All English transcripts were independently coded, annotated, and analyzed using NVivo (Version 12) software by all three authors. First, an initial codebook was developed by the first author based on the research questions, interview guides, and a review of three randomly selected caregiver transcripts. Second, data analysts independently conducted line-by-line coding of each transcript using NVivo. In addition to assigning codes, the analysts documented memos while reviewing each transcript. The

three authors iteratively refined the codebook based on independent reviews of additional transcripts, ongoing data analysis, and recurring discussions. Third, weekly meetings were held throughout the analysis process over a three-month period (November 2020-January 2021) to confirm code agreement, resolve any disagreements, review memos, and discuss emerging themes. Finally, supporting evidence reviewed across sets of codes to generate and contextualize themes, which were discussed weekly through a consensus building process among the analysts.

Ethical considerations

The research protocol of this qualitative study was reviewed and approved by the Institutional Review Board of the Harvard T.H. Chan School of Public Health (Protocol #: IRB19-2185) and the Bioethics Committee of the MoH in Mozambique (Reference #: 180/CNBS/2020). Consent forms were read aloud in Makua or Portuguese by trained research assistants to all participants. Participants either signed the consent forms or gave their fingerprint to indicate consent.

RESULTS

Sample characteristics

We interviewed 73 respondents: 36 caregivers, 15 health facility providers, 12 community providers, and 10 stakeholders (including district or provincial health professionals, PATH program staff, and representatives from other organizations). Of the 36 caregivers, 17 had most recently gone to the health facility for a CCS (well child) visit, while 19 had gone for a CCD (sick child) visit. The sample of caregivers included 32 mothers, 3 fathers, and 1 uncle who was the primary male caregiver of the child and self-identified as the child's "father". Henceforth, we refer to these four male caregivers as fathers. The sample for caregivers and providers was equally distributed across the three health facility catchments areas, with the exception of APEs for which there are none working in Monapo Sede.

Table 1 presents caregiver and child sociodemographic characteristics. Most caregivers were young adults with primary school as their highest level of education. The majority of index children were under age 12 months, and households had between 3 and 4 children on average. The average walking distance from caregivers' households to the local health facility was approximately 40 minutes, or approximately a 5 km distance to the health facility (and outside of APE catchment area). On average caregivers visited health facility five times in 2020 (Jan-October 2020) or every two months.

Table 2 presents sociodemographic characteristics of the providers and other health stakeholders. Note that there are no APEs in Monapo Sede, hence the number of community providers interviewed in Monapo Sede was only 2 (one ADEMO and AMASI activists). Most providers were women, whereas most stakeholders were men. The majority of providers completed secondary school or higher.

Table 1. Sample characteristics of caregivers of young children under age 3 (N=36)

Caregiver and child characteristics	**N (%) or mean (SD)**
Caregiver relationship to child	
Mother	32 (89%)
Father	3 (8%)
Other male caregiver (i.e., uncle)	1 (3%)
Caregiver age (years)	
18-24	21 (58%)
25-34	15 (42%)
Caregiver highest education level	
None	3 (8%)
Some primary	9 (25%)
Completed primary	15 (42%)
Completed secondary	9 (25%)
Caregiver occupation	
Housewife	21 (58%)
Farmer	9 (25%)
Informal business	4 (11%)
Teacher	1 (3%)

Office clerk	1 (3%)
Child age (months)	10.8 (8.3)
Child sex	
Male	19 (53%)
Female	17 (47%)
Average number of children	3.4 (1.8)
Average monthly household income (MT)*	2,482 (2,011)
Average walking time from household to health facility (minutes)	37 (21)
Average number of times visited health facility between Jan-Oct 2020 (past 10 months)	5 (3)

*1 Mozambican metical (MT) is equivalent to 0.013 US dollars.

Table 2. Sample characteristics of providers and other health stakeholders (N=37)

	Types of providers					
Provider characteristics	**Health Facility Providers (N=15)**		**Community Providers (N=12)**		**Other stakeholders (N=10)**	
Roles	MCH nurse	6 (40%)	APE	6 (50%)	NGO program staff	3 (30%)
	Well-baby providers	3 (20%)	ADEMO	3 (25%)	ADEMO supervisor	1 (10%)
	Sick-child providers	3 (20%)	AMASI	3 (25%)	AMASI supervisor	1 (10%)
	Health facility director	3 (20%)			APE coordinator	1 (10%)
					Other Ministry of Health representatives*	3 (30%)
					UNICEF health and nutrition specialist	1 (10%)
Provider age (years)	32.7 (10.0)		38.3 (11.3)		45.5 (4.4)	
Provider sex						
Male	3 (20%)		5 (42%)		9 (90%)	
Female	12 (80%)		7 (58%)		1 (10%)	
Provider highest education level						
Some secondary	2 (13%)		1 (8%)		--	
Completed secondary	5 (33%)		4 (33%)		3 (30%)	
Professional degree	3 (20%)		5 (42%)		6 (60%)	
University Bachelor's degree	5 (33%)		2 (17%)		1 (10%)	
Average number of years employed in role	8.4 (9.3)		5.1 (3.6)		5.1 (4.3)	

Cells represent N (%) or mean (SD). *Ministry of Health representatives specifically include: head doctor, MCH district lead, district nutrition and ECD focal person.

Structure and Overview of Results

In the following sections, we structure our results by the different groups of respondents, beginning with the perspectives among district stakeholders (section 1), followed by providers (health-facility and community-based providers; section 2), and finally with caregivers (section 3). In each of these sections, we then further structure our results in accordance with the four overarching research questions: reported roles and program engagement (A), perceived acceptability (B), barriers and facilitators (C), and finally perceived changes as a result of the program (D). **Table 3** highlights the key findings. We conclude with a final section summarizing how COVID-19 influenced program implementation from the perspectives across all the respondent groups.

Table 3. Summary of main findings by program evaluation dimension (rows) and primary respondent groups (columns)

	District stakeholders (MoH, APE, ADEMO, AMASI, UNICEF)	Providers (technicians, nurses, APE, ADEMO, AMASI)	Caregivers
Program engagement *Listed in order of frequency mentioned*	Roles and responsibilities: - Training their colleagues to increase awareness and counseling for ECD - Strengthening systems to promote ECD (e.g., supervision, referrals, M&E) - Participation in district and provincial technical working groups for ECD	Messages promoted: - Nutrition, breastfeeding, and dietary diversity for young children - Maternal and child health - Developmental monitoring - Stimulation practices - COVID-19 prevention measures - Father involvement in nurturing care	Messages received: - Nutrition, breastfeeding, and dietary diversity for young children - Maternal and child health - COVID-19 prevention measures - Developmental monitoring - Stimulation practices - Father involvement in nurturing care Most common sources of information: (1) health facility providers, (2) media, and (3) community-based providers
Acceptability	- Coordination and collaborations fostered among various district stakeholders/partners were valued by all - ECD messages were perceived as acceptable and informative	- Satisfaction with the trainings received - Satisfaction with the supervision received - Acceptability and usefulness of program content and materials	- Nutrition and parenting messages were all described as useful - Satisfaction with interpersonal counselling received from health facility providers - Those who observed videos enjoyed them - Some dissatisfaction with long waiting times at health facilities
Barriers/challenges	- Resistance to change among some providers and at health facility operations-level - Generally long patient waiting lines at health facilities - Limited staff at health facilities - High staff turnover - Far distance between households and health facilities - Poverty (e.g., low financial resources, low providers salaries)	- Inadequate resources to carry out responsibilities (e.g., infrastructure, personnel) - Increased responsibilities associated with the intervention and low motivation among some providers - Language barriers (i.e., no fluency in the local language) - Weak linkages between health facilities and community providers	- Lack of money (e.g., cannot afford to buy medicine or nutritious food for children) - Some households are far from health facilities - Some intervention material cannot be understood by some caregivers (i.e., Portuguese language barrier or illiteracy) - Lack of male caregiver engagement in children's health services - Limited presence of community activists (APEs, AMASI, ADEMO) in some communities

Facilitators	- Strong leadership and support from district government	- Trainings to providers - Supervision to providers - Provision of materials and job aides (e.g., posters, pamphlets, diagnostic tools and equipment)	- Reinforcement of messages at both health facility and community levels - Messages that do not require financial input from caregivers - Community groups to discuss nurturing care with peers - Availability/use of local resources (e.g., surplus harvest from caregivers' farms)
Perceived changes to health system	- Stronger partnerships among district stakeholders and partners - Improved referral processes - Increased capacities for monitoring and evaluation of children at-risk - More efficient health system operations and streamlining of child-centered services	- More efficient health system operations and streamlining of child-centered services - Some reductions in waiting time (CCS in particular) - Improved referral processes - Increased awareness of health system's role in promoting ECD - Collection and monitoring of ECD indicators in health information system	- N/A
Perceived changes to providers	- Increased knowledge of ECD - Increased appreciation for the links between ECD and nutrition - Enhanced training and supervision received by providers	- Improved knowledge of ECD - Sensitization to the importance of nurturing care for ECD - Enhanced counseling skills - Increased number of responsibilities	- N/A
Perceived changes to caregivers	- Improvements in some caregivers nurturing care behaviors (feeding practices and provision of homemade toys)	- Sensitization around various community health issues (e.g., decreasing stigmatization of HIV, addressing gender norms/male engagement) - Increased participation in child health services - Increased engagement of male caregivers in childcare - Improved child health outcomes - Increased identification of children at-risk (developmental or nutritional)	- Improved care for child health and nutrition - Increased participation in child health services - Increased engagement of both male and female caregivers in play activities with and provision of toys for their children - Improved child nutrition and health outcomes (e.g., lower rates of malnutrition and illness)

Section 1: Program engagement of PATH and key district stakeholders

1A: Roles and involvement

PATH

PATH program staff described key roles in technical support, coordination, and provision of resources to promote ECD through the ongoing work of various partners both at health facilities and community levels. Specifically, PATH district officers and the provincial coordinator summarized the following key roles:

- Leading trainings to increase awareness of ECD and integration of ECD service delivery - general classroom trainings for MoH and partner representatives, training-of-trainers, on-the-job trainings.
- Providing materials - posters for health facilities, radios for health facilities and community-based providers, flash drives with songs and messages for radio broadcasts.
- Providing technical assistance and supporting government-led supervision of health facility and community providers with a specific focus on implementation and quality assurance.
- ECD advocacy and building partnerships with other relevant actors in the district and province. Relevant partners mentioned included various community activist groups, other NGOs, Pathfinder, ICAP, and FHI360. Participation and representation at government meetings were also mentioned.
- Strengthening linkages between health facility and community services through referrals, follow-up and outreach brigades.
- Supporting efforts to collect and monitor data on ECD within existing information systems.

For example, pertaining to this last point about data collection, a PATH district officer explained how an indicator for potential child developmental delays was advocated for and added to APE summary tools as part of the pilot intervention.

> *We had changes with the summary forms that the APEs use in the registration of primary cases. Before, these forms did not include information regarding delayed psychomotor development and that always brought constrains due to lack of specifications in the form. We negotiated with the health services and we opened a space where information regarding early childhood development and delayed psychomotor development and the modification was a success. (PATH PROGRAM TEAM-2)*

Ministry of Health

MoH representatives described key roles in training colleagues within their divisions to increase knowledge about ECD and supervising the integration and implementation of activities to promote ECD as part of routine health services at the health facility and community levels. For example, a MCH district lead shared:

> *We verify and undertake supervision, technical assistance for all those who were trained in this area. We trained our staff to monitor women from their pregnancy phase, at the maternity*

and the monitoring of the child till 5 years…We did not know that the psychomotor development starts from the womb and that this mother needs to talk from the womb till the child develops. (MoH-2)

MoH representatives also highlighted their role in providing technical support for the identification of children with potential developmental delays and strengthening referrals for such children at-risk to health facilities. Moreover, MoH representatives explained how coordination between health facilities and community services was strengthened as a result of the interventions. For example, the APE district coordinator described greater support and partnerships between health facility providers and APEs.

The APE focal point who is at the health facility is an internal arrangement from the Ministry of Health. Before the provider could not leave the health facility to go and meet with different APEs who are in the areas the health provider is working. With PATH, there was a MoU for transportation and refreshments as incentives to the provider. (APE REPRESENTATIVE)

Other partners (ADEMO, AMASI, UNICEF)

ADEMO and AMASI representatives had similar roles in training activists regarding ECD, strengthening linkages between health facilities and communities including referrals, and increasing monitoring and evaluation efforts. For example, the ADEMO supervisor explained how activists encouraged families to seek healthcare and played a key role in strengthening referrals.

Our activists serve as the link between the community and the health facility, even for the child's family. It is the activist, who alerts the community there is a health problem and it is supposed to be solved at the health facility. There are cases considered as "lost cases", where a family stopped going to the health facility, due to long distance from home to the hospital. For fear or lack of financial means, the activists identify that family and sensitize, and they go back to the hospital and even the health providers get surprised when they see them again, because they had already considered that as a lost case, maybe due to some challenges the family was not able to continue with the treatment and no one had gone to check on them. The activist does follow-up at the health facility and at home in a period of one to two years and some caregivers might feel tired and they give up. The activist is there to encourage the caregiver to continue with the treatment for her child. Activists are people with knowledge that can help the families continue following correctly the recommendations given to them at the hospital. (ADEMO REPRESENTATIVE)

Finally, the UNICEF representative also expressed involvement from the outset of the pilot in 2018 through engagement in the recruitment of the PATH provincial coordinator and as a member of a multisectoral technical working group with other district partners working to promote ECD in Monapo.

1B: Acceptability

All partners underscored the importance of the pilot intervention. Partners highlighted how the multisectoral program supports the government, strengthens existing services, and builds

partnerships crucial for supporting young children and their families. For example, a UNICEF representative described the positive collaborations formed across partners.

> *At the community level, the APEs are trained not only by PATH on ECD but also trained by the Government and other actors based in Monapo. So a kind of convergence of interventions is happening there, where PATH, COVida, UNICEF and Government and other institutions are making effort to go the same place and support the community and the beneficiary. (UNICEF REPRESENTATIVE)*

Additionally, the UNICEF representative shared that there is an increasing demand for ECD interventions in other districts as a result of the strong coordination among partners in Monapo.

Government partners specifically emphasized how developmental monitoring and stimulation messages for ECD were critical, relevant, and valuable for both the providers and the community. For example, an MCH district lead shared the new knowledge that she gained on ECD and how much she enjoyed learning this.

> *Particularly for me, what really impressed me was especially the toys [laughs…]. We used to think that the toys can only be acquired from the shops, but with PATH, we have been explained to that whatever we have, we could transform it into a toy for the child to play with. This is very positive and the community can do this but at that time the information was not there. For us, a mother making a doll for a child was a taboo. Yes, it was a taboo but with this intervention, a mother can now play, there are toys for the children. This impressed me a lot. Another thing was this communication while the baby is in the womb. "How are you baby" the husband also communicating. During the first days, we had a lot of challenges, "nurse, how can I talk to the baby in the womb" [laughs…]. This really impressed me a lot [laughing]… if this message would spread in the whole province this would be very good. (MoH-2)*

The ADEMO supervisor also shared the relevance and importance of supporting developmental monitoring for children:

> *This intervention is most welcome, and it is worth investing. I am a person with disabilities and when I go to the community and find some case that can correct, I come to a conclusion that if my caregivers had knowledge during my tender age, maybe my case could have been solved. When a child is born during a prolonged birth or acquired disabilities through something bad due to lack of knowledge from the child´s caregivers or the community, this child grows with disabilities that maybe could have been avoided somehow. If the problem is solved very early, there are high probabilities that that child will walk as time goes by and even go to school to have an education. (ADEMO REPRESENTATIVE)*

1C: Barriers and facilitators

Barriers

Partners mentioned several barriers to behavior change and program effectiveness. Specifically, the PATH program staff reiterated how some **providers' reluctance** to carrying out such program activities and general **apathy or even resistance at both the provider and health facility levels** to oversee implementation undermined program potential.

We are facing some situations that the integration of ECD is not progressing the way we would have liked it to be… If the health provider receives all this information and does not embrace it, does not really bother to implement, to change his/her behavior to start implementing, this will not function. There is negligence. There is an "I do not care attitude" by some health providers to understand the importance of transforming this activity as routine, as part of her/his work on the daily basis. (PATH PROGRAM TEAM-1)

Furthermore, others elaborated about how broader structural health system challenges were additional barriers to optimal program implementation. For example, one PATH staff described how the **long patient waiting lines** at facilities compromised provider adherence to counseling protocols.

We have some health providers that have understood, we have very concrete examples of those who have understood, they call when they have a question, because they would like to know something. But there are others who ignore, when she/he looks outside and sees so many people on the queue, he/she becomes intimidated and starts attending for the sake of it without following protocols. This is a problem that should not happen, because he or she is not providing the attention needed to that child to receive the services needed." (PATH PROGRAM TEAM-1)

Several MoH representatives reiterated how **limited staff availability** was related to long waiting lines and also negatively impacted counseling quality.

There are some challenges regarding the seriousness of some health technicians who receive this information so that they can support the integrated services in the area of early childhood development. It is not effective in the consultations, because we are few and the queues are long, that makes it not enough for one technician to attend to all cases with the required attention to each case. This is the biggest challenge. (MoH-4)

A challenge for some colleagues is they might know the information but maybe because of time limitation, they opt not to follow maybe when they look outside and see the long queue… We also have a lack of human resource in this area … There is only one nurse for pre-natal, maternity, family planning, all this, under the hands of a single nurse. She can undertake the work, those with a good will, however, the work could still be deficient. If there was a way if the personnel could be increased this would be very good. (MoH-2)

In addition to the shortage of workers, **high staff turnover** was identified as another challenge affecting trainings and program efforts.

There have been changes with the way we are providing mentoring to the health providers at the health facilities. When we started, we had designed mentoring, I used to go there with some tools and I used to go there to mentor. However, we felt that this was not producing the desired effect, because at the health facility levels there is a lot of staff rotation. Today I worked with you, I mentored you, I marked everything but when I come back next time to continue with the mentoring I find out that you are no longer at the health facility, you have been transferred to another place where I cannot follow-up with the work that I started. You will not use what I provided to improve your capacities. Another day I come and you are on leave, or you are on night shift. We had to change the mentoring to provision of technical assistance. However, this technical assistance as well, we understood that this technical

assistance, could not be provided exclusively by me. We ensured that that the heath facility director had to provide this technical assistance to his/her colleagues at the health facility. (PATH PROGRAM TEAM-1)

Partners highlighted **geographical distance** between households and health facilities as another barrier to building linkages between community and health facilities, to referral processes, and to caregivers' health seeking behaviors.

Our main challenges are the distances between the health facility and the community. We have had cases of referrals where caregivers do not follow up on treatment, because of the long distances they have to cover to get to a health facility. We would like all referred children to get to the health facility, the cases of abandoning treatment are also a weakness to us. (PATH PROGRAM TEAM-2)

As a result, partners suggested that health facility providers should conduct more community outreach initiatives to reach households.

Respondent: We have challenges for children with delayed psychomotor development, the community that lives very far do not have the resources to continue with the rehabilitation process of their children when they are recommended on the day they leave hospitalization.
Interviewer: And what can be done to overcome that?
Respondent: it would be good if the health technicians would visit the community with some tools to stimulate physical activities of a child in rehabilitation… Creation of reception centers and children assistance in the communities that are very far located from the health facility, create health fairs to promote health in the communities and localities. (AMASI REPRESENTATIVE)

Finally, partners underscored how conditions of **poverty**, inadequate financial resources, and low providers salaries affected their work at an individual but also systems-level.

Respondent: There is a lack of staff here.
Interviewer: Why do you have only one person doing everything?
Respondent: Lack of funds to pay them. We have a lot of people or technicians in the MCH area, however, they are all sitting, some have stopped working, while others have finalized their studies. There are no resources to pay their salaries. Even at the health facility, there are some volunteers who are working without pay. (MoH-2)

Moreover, partners described poverty as a cross-cutting barrier that further affected caregivers' health seeking and capabilities to provide optimal diets for child nutrition.

When we talk about feeding a child well, but the caregivers do not have the conditions for such. They argue that they do not do it because they do not have food to feed them. They are always asking for support. (AMASI REPRESENTATIVE).

Most of the families have very few resources. We do not know how to get someone with no transport from a distance of 50 km to the hospital. The other challenge is the lack of income generating activities for the caregivers, so that when the project comes to an end, they will have no means to continue with accompanying their children to the hospital. (ADEMO REPRESENTATIVE)

Facilitators

Partners consistently highlighted that strong leadership was critical to the success of this multisectoral initiative. They specifically emphasized the role of **district government leadership** in prioritizing, mobilizing, and enacting an agenda that could result in more standardized and sustainable change.

I think that the factors that could enable our work to succeed in the district are involvement of the local leadership. The involvement of the local leadership and this I am referring to huge involvement of the district directorate of health management with the services at the health facilities levels, the head doctor. Afterwards, the involvement of the governance leadership to understand and acknowledge that the ECD issue is a priority. We know that if everyone is not fully on board while at the embryonic phase in what is the quality of life of that child, while still early, that child to be protected for his or her future life. If this will not happen now, the providers will not bother to know what is happening to that child. Therefore, the involvement of the health leaders, especially the local government, in order to sensitize the whole community, every political and decision-makers. If this will not happen now, then we are putting the district of Monapo at risk and consequently, this also affects the whole country, the whole nation. (PATH PROGRAM TEAM-1)

I think yes it could be scaled up to the districts. But there is the decision maker: the Government. So, the Government is the owner of the process who could say we really need to roll out this intervention and so they need support on how to integrate best practices. (UNICEF REPRESENTATIVE)

Government leadership at the district and provincial levels was perceived as crucial for bringing together various partners around this common vision.

The obstacles that we have noticed are first, the ownership on the part of the health system. There has been some resistance on the ownership of the approach. However, we do understand that this is a process. We are learning through this process and little by little they are taking the responsibility of this ownership process.
The second that I can highlight now is with relation to the integration with the other partners. The partners are still are in a competition mode, when we want to integrate this approach in their activities, they look at it from a competition point of view. This is one of the greatest obstacle because the partners end up not doing much with regard to our expectations because of this competitive spirit… What we are doing now is involving the leadership at the provincial levels. So that it will be them passing this information to the district, on the knowledge and the same message that they are at the forefront and should lead the process. That this intervention does not belong to the partner, this belongs to the government and that the partner is just helping. Some things are changing and little by little, we can notice some changes. At the partner level, we are trying to integrate the content, this approach in some platforms at the highest level at the provincial level. We are trying to lobby the office of the first lady of the State Secretary at the provincial level given the fact that they work with partners, so that it will be the work of the government to inform the partners that this ECD approach should be embraced by all partners and they should support it." (PATH PROGRAM TEAM-3)

1D: Perceived impacts

All partners reported that their knowledge and appreciation for ECD improved as a result of the training received and their involvement in this intervention.

> *Delayed psychomotor development is a problem we have in the community for many years and we as health service providers we give very little attention to. Therefore, this project came to open our minds more regarding this issue, we do not only work on the identification of cases, but also, we try to understand other factors that are associated with the delayed psychomotor development such as malnutrition. (APE REPRESENTATIVE)*

Several partners particularly underscored this last point about how they gained a greater appreciation for how nutrition and ECD are critically interrelated or "walk hand-in-hand."

In addition to the improved coordination among district partners as mentioned above, stakeholders also underscored how the technical support received from PATH, through supervision and enhancements to monitoring systems, positively improved their work. For example, the AMASI director highlighted how PATH supported referral processes and strengthened capacities for monitoring and evaluation efforts.

> *We used to work in general terms within the context of the children's situations who are infected and affected by HIV. We used to make referrals for cases related to malnutrition, but we still did not have the concept we now have that has strengthened our work with children. PATH gave us the capacity in other areas and increased more information in our forms we use for registration. Now when I identify a case of a child within the target group and with problems within our scope of work, I communicate to PATH for their intervention. When we make referrals to the hospital, we also communicate to PATH. We are improving the lives of the children. (AMASI REPRESENTATIVE)*

PATH staff similarly highlighted their key roles in providing technical support to providers regarding the collection and tracking of the developmental delay indicator within the existing health system registries.

> *Presently, due to PATH here in Monapo, information linked to ECD are being collected clearly in the statistics books. Previously in these books, nothing was mentioned about delays in psychomotor development. There was no knowledge of doing this and that in order to identify the cases with delay in development. This is an indicator that can be found in the government tools of which ECD which the program is monitoring… Other districts know that it exists, but they do not have the strength or reinforcement that Monapo has in order to undertake a proper follow-up. In this regard, Monapo has the advantage compared to the other districts. (PATH PROGRAM TEAM-1)*

A MoH head doctor shared how PATH's technical support at health facilities and on-the-job training and supervision -- "helping and showing by example how to undertake a consultation process" -- was invaluable and assisted with the human resource challenge by improving efficiency and quality in service delivery. More broadly, PATH program staff believed the program also improved operations and the environment of health systems by streamlining services to be more child-centered.

> *Our services are integrated in order to guarantee that if the child goes to the hospital then he/she receives our intervention within that particular clinical consultation. Starting from the one-stop-shop [triage], CCS, CCD, pediatric unit, every place. That is the reason we would like that in every place that the child passes, he/she should be treated in a humanized way, in a*

friendly way, that the space will be a joyful environment, inviting and comfortable. This part of the intervention has brought good results currently, we are noticing that our health facilities have joyful spaces, the environment is inviting and joyful and all this is beneficial for the child. (PATH PROGRAM TEAM-1)

Finally, partners also perceived improvements in some caregivers' nurturing care behaviors. MoH representatives highlighted how providers and caregivers alike enjoyed learning about making toys for children, which was new information for the entire community. For example, the head doctor shared how some parents have provided homemade toys for their children.

We managed to see in some of the houses some toys, because the reality in the community is that they think that a toy is only the modern one that you can buy from the shop. But we had this opportunity to demonstrate that even from the local materials, it is possible to make toys, a bottle of water could be used to make a toy car and the child could play with it. Consequently, when we saw this, we realized that these talks though they happen at the hospitals and at communities though not all, some of the community members are now starting to implement what they are learning. (MoH-1)

Other MoH representatives described positive changes in caregiver knowledge of nutritional foods, dietary diversity for young children, and health seeking behaviors for child malnutrition.

Section 2: Providers' experiences with program

2A: Messages delivered

Providers delivered a variety of health messages to caregivers in the community and at health facilities. Most messages concerned MCH and nutrition, including HIV, handwashing, malaria, the importance of exclusive breastfeeding, and providing a well-balanced diet for young children. These messages were consistently delivered by both health facility and community providers. Health facility and community providers also counselled caregivers on how to provide homemade toys for their children and emphasized the importance of playing and communicating with children of all ages. However, messages on parenting for ECD were mentioned less frequently compared to nutrition and health messages. While this is largely exploratory, it appeared that CCD (sick-child consultation) providers more frequently mentioned delivering ECD messages and covered a wide range of ECD topics than CCS (healthy child consultation) providers.

At the health facilities, providers often delivered one large group educational talk at the start of the morning in the open waiting area where all caregivers were waiting to be seen. Nurses and other health facility providers shared information about various topics ranging from MCH, nutrition, HIV, COVID-19, to stimulation.

Morning educational talk at Monapo Sede health facility

Morning educational talk at Carapira health facility

In addition to the large group educational talks, health facility providers conducted individualized counseling sessions with caregivers. In the community, all community activists described conducting home visits to support caregivers, while only APEs mentioned additionally facilitating community group meetings.

Most providers delivered multiple messages – most commonly covering nutrition, health, developmental monitoring, and family planning. Community providers in particular also frequently mentioned discussing COVID-19 prevention and the importance of WASH practices.

Health facility providers consistently mentioned how the Nurturing Care pilot introduced ECD messages (i.e., developmental monitoring, stimulation) as part of their responsibilities.

> *Before the pilot interventions I was a nutritionist. I used to work with hospitalized children for the nutritional rehabilitation and with the outpatient services. I would do screening for malnutrition in the maternity or in the CCD consultations - we evaluate the child's weight, we checked the growth curve and evaluated the branchial perimeter, and if during this process, a child showed some malnutrition signs, we would immediately make referral for hospitalization. With the intervention a lot has improved in the hospitalization area, because of the capacitation they gave including the tools for the work. It was a lot of information that was passed to us and we learnt a lot regarding early childhood development. (CCS TECHNICIAN-CA-1)*

Moreover, a few health facility providers also highlighted how provide counseling on father involvement specifically as part of ANC visits, including fathers' accompaniment to health facilities and paternal involvement in stimulation.

> *I work with children and expectant mothers. First, my consultations with expectant mothers, where I counsel them and encourage them to bring their spouses during the consultations. I also counsel them on how the expectant mother should take care of her spouse and on the other hand how the spouse should take care of the expectant mother. I explain to them the importance of the father to be to speak to his child while still in its mother's womb so that the child can learn to listen and hear his/her father's voice that will help the child distinguish the voice in the future after the child is born. (MCH NURSE-MR-1)*

Community providers described a much greater focus on identification of children at risk of developmental delay than promoting parent-child relationships and providing counseling on increasing engagement in stimulation activities. In particular, ADEMO and AMASI activists consistently reported making referrals for children at risk of developmental delays, while APEs less frequently described making referrals. For example, an ADEMO activist described how more referrals have been made as a result of the screening tools and resources provided through the pilot program.

> *The difference now is that with RBC we never used to send children to the hospital, we did not have measuring tapes, we did not have manuals, we only had the experience to help that person who has disability. We used to help them with homemade materials for physiotherapy but we never used to send anyone to the hospital. The difference we have now is that in PATH we have materials: manuals. Ok, we used to have manuals but it is different with PATH, because now we have credentials from the health facility, we have tape measure to measure the child to know if the child is malnourished, we have a form with all the important phases of life from 0 to 5 years, we also have tip-tap which we did not have before, we did not have radios for the people to listen to, all this. (ADEMO-MR-1)*

This particular emphasis among ADEMO and AMASI activists on identifying children at-risk and spending less time on stimulation counseling may be consistent with their training and approach of providing targeted services and facilitating higher-level support for vulnerable population.

Demonstrations and job aids were frequently used to deliver messages on nutrition and parenting for ECD. Several health facility providers as well community providers described using demonstrations and job aids as part of delivering messages for nutrition and ECD. For example, a CCD nurse described how she used posters during her consultation to explain developmental milestones.

My role is identifying children with anomalies of early childhood development and treating those anomalies, counselling the mother and later on monitoring of that child and if it is a case that requires to undertake a referral to the district hospital, or physiotherapy, I do it and explain to the mother how she is supposed to care for that child. This is because there are children who come here with delays, but these delays are not caused by any diseases, it is because the mother is always carrying the baby on the back and does not leave the child on the floor to relax and play... In these situations, we have to explain to the mother on what to do, massaging the baby, so that the baby can grow based on the stages as highlighted by that framework over there. [she points to the poster that highlights the various stages of a child development from 0 to 5 years] We use that to explain to the mothers because there are children who are already 9 months old and they do not sit… When we are explaining, we do request the mother to stand up and to follow while we are explaining using the posters that she should do this and that, and we explain to her things that she need with regard to nutrition and when they seat, they pay attention to the posters as well. (CCD TECHNICIAN-MR-1)

ADEMO activists mentioned a bag of toys, manuals, MUAC tape, and radios.

We use some materials to discover if the child is healthy or not for example. [he reaches out in his bag and removes a soda can filled with some pebbles and a stick that serves as a holder and rattles it], the material is always in my bag. This is traditional material from local resources for example [he points his finger to the rattle] a child who is six months, when he/she wants to cry, we shake the can and we know that if the child hears, she/he will stop crying through the material we are using. We also monitor their development using an object we put in front of the baby and we start moving the object and if the child if following with his/her eyes that object, then we know that the child is healthy depending on the age he/she has. If it is a child of 3 years, we use a ball, we take the ball and we start playing with the child [he also removes a ball made of local materials] this ball. I take this ball and play with the child and that is when I evaluate whether the child is healthy or not. (COVIDA/AMASI-MS-1)

On the other hand, fewer APEs mentioned using any job aids, besides receiving flash drives with radio broadcast messages. One APEs described facilitating community group cooking demonstrations for how caregivers could prepare nutritious foods for young children.

There are days that my educational talk is focused on demonstrating how to make enriched porridge in your house… I normally go there with my cooking pots, flour, peanuts and firewood we look for it in the communities and the flour they say they do not have it hence we contribute between activistas to buy flour and then we go there to undertake a live demonstration how to cook enriched porridge. (APE-MR-1)

One health facility director shared how health facility providers had also occasionally facilitated group cooking demonstrations in the community on Saturdays.

2A: Training

Overall, all health providers mentioned receiving training to some degree on ECD. The health center directors most clearly described the training components introduced through the pilot program and explicitly linked the training received as supported by PATH. They reported that training was 3 days long and targeted all providers who work with children. The training covered how to use new tools: *"the CCS book; CCD; daily summary for CCS and CCD; and another new tool on psychomotor for children, in that our attention should be focused on children of up to 2 years to provide monitoring support to children of this age group" (HF DIRECTOR-CA-1).* The director consistently expressed the trainings were successful:

> *When the project arrived, the focus was to show us all the tools that we already had that could be used to help early childhood development, in our mind though we had these instruments, we did not regard them as important, they really started by telling us that we have the tools and just wanted to know what follow-ups we do relative to early childhood development… Presently, when you talk about Early Childhood Development, every staff especially those working with children are able to explain you the details and are paying greater attention to the issues we once ignored. (HF DIRECTOR-MS-1)*

All health facility and community providers also recalled some degree of ECD training. Three ADEMO providers reported receiving one two-week training focused on care for children 0 to 5 years of age. One ADEMO provider reported that their supervision meetings every Friday also served as a refresher of the things they learned during training (ADEMO-CA-2). ADEMO activists recalled training received from Reabilitação Baseada na Communidade or RBC (a prior project that supported ADEMO in Monapo) and highlighted how training through this pilot covered similar topics with respect to identify children with potential developmental delays. However, ADEMO providers shared how PATH additionally provided training to identify malnourished children and mentioned receiving tools such as mid-upper arm circumference (MUAC) measuring tapes for child assessments (ADEMO-MR-1).

All COVida-AMASI activists also reported learning about ECD from PATH as well. Specifically, they learned about "mental health, social and psychosocial" and how to play with children (COVIDA/AMASI-CA-1). APEs also recalled receiving training on ECD, including suspected cases of malnutrition and delayed psychomotor development (APE-CA-3). Compared to the other activists, APEs were more like to mention receiving training from the Ministry of Health, as expected; still about half of APEs mentioned PATH involvement in their training received.

Health facility and community-based providers were satisfied with the training and unanimously reported that their training received prepared them for their current roles and responsibilities. Only one COVida-AMASI provider said that although the training helped, they felt it was not enough and they still had a lot to learn (COVida/AMASI-MR-1). The same provider indicated they would like more training and capacity building.

2A: Technical assistance and supervision

Since the introduction of this intervention, health facility providers reported receiving more focused technical assistance and supervision. While there are important distinctions between the various types of support offered to providers involved in this pilot (e.g., technical assistance, mentoring, supportive supervision; see intervention description section for these distinctions), most respondents broadly and collectively referred to the different types of support and supervision as "supervision".

> *Before they would only ask us how a specific activity is done, but that was not very frequent. They never used to observe cases as we do it now. There are more requirements and display in the correct way. Before we were only told do not do that, they never used to tell or demonstrate to you what was the correct way of doing things. [Dr. X] will not let you forget anything. Things have really improved a lot and we are doing our best to continue giving the best services every day. (MCH NURSE-MR-2)*

Health facility providers mentioned receiving supervision from the health facility director, someone affiliated with PATH, and/or other non-related partners through another project. Supervision mostly seemed to occur monthly, though some providers indicated more frequent visits. For example, one CCS technician reported that officially supervision was monthly, but the supervisor often came every two weeks (CCS TECHNICIAN-MS-1). One MCH nurse reported bi-weekly technical support (MCH NURSE-MR-2), whereas another reported the supervisor was at the health facility every 3 days (MCH NURSE-CA-1). Another provider described the supervision as a cycle: *"Each week, he works with one nurse and he only comes back to work with me again when he is through with the others, it is a cycle." (MCH NURSE-CA-2)*. One provider noted a reduction in the frequency of supervision received due to the COVID-19 pandemic (MCH NURSE-MR-1).

Providers consistently expressed satisfaction with the technical support received. Providers described various types of support received, including observations and on-the-job training and feedback, technical assistance, as well as coaching around how to overcome challenges and also through demonstrations of activities (MCH NURSE-CA-1).

> *Interviewer: What kind of supervision do you receive during this intervention? Respondent: I sometimes work with [Dr. X], he supports me a lot in my work regarding PATH intervention. I do my consultations with him and he tells me what is good and what requires improvement. He always leaves some recommendations on aspects that need improvement. It is a blessing. (MCH NURSE-MR-1)*

Support and supervision also helped address structural challenges at the health facility level in addition to helping address individual challenges at the provider level.

> *...we have [Dr. X] who is here and works with us directly here at the district level, he is one open person, very near to us that offers whatever support that we might need, he is the focal person who always underlines our challenges to the outside world and he is always here at the health facility many times, he has been visiting various units, he also meets with me frequently, updating me of some issues he has noted for improvement in his technical backstopping role while leaving some recommendations for improvement. He also asks us to come up with solutions to certain issues that he has discovered or we have discovered on our end. In terms of support and supervision, I do not think that we have any reason to complain. [Dr. X] is very flexible and if I call him because I have an issue, he is here immediately for us to try work out*

solutions. He is always around even without informing, I refer to him as someone who belongs here because even without informing he is working with my colleagues. (HF DIRECTOR-MS-1)

Health facility providers were generally satisfied with both the frequency and type of support they received. The CCS technicians, who reported receiving monthly technical assistance, indicated that they would like more frequent supervision, e.g., 3 times per month (CCS TECHNICIAN-CA-1), and more feedback on their work and how to improve it (CCS TECHNICIAN-MS-1).

The supervisory structure for community providers often involved interactions with one main supervisor, was much more variable depending on the activist groups, and largely from individuals in their own organization and/or an officer from PATH. The three interviewed COVIDA-AMASI providers reported different experiences of supervision. One provider reported receiving weekly supervision with their planning, and a one-off observation during a home visit (COVIDA/AMASI-CA-1). Another provider reported monthly supervision where they received feedback on their performance and on toys to use during their home visits (COVidaAMASI-MR-1). The third provider reported monthly supervision for planning as well as observations during home visits, though they did not specify the frequency of observations. They also reported their supervisor talking to the families and, in particularly challenging situations, leading the home visit to sensitize the family in a different way (COVida/AMASI-MS-1). The three COVida-AMASI providers were generally satisfied with the supervision though two of them made suggestions for improvements. One shared that the supervisors could facilitate an internal mechanism between health providers and activists so that the latter can confirm that caregivers are going to the health facility and implementing the advice they are giving them (COVida/AMASI-CA-1). All three COVida-AMASI providers reported no particular changes to supervision as a result of the pilot intervention.

ADEMO providers reported attending a weekly meeting to evaluate their work of the week, receive feedback and materials, exchange experience and ideas, and receive reminders of what they learned (ADEMO-CA-2; ADEMO-MR-1). They also reported receiving observations during the home visits (ADEMO-MS-1). One activist described no changes to supervision received as a result of the pilot (ADEMO-CA-2), while another reported receiving greater supervision since the pilot intervention (ADEMO-MR-1). All three ADEMO providers were satisfied with the frequency of supervision. When asked what additional support they would like to receive, two of the providers indicated food for the children they are visiting.

APEs mostly reported receiving monthly supervision, including observation of home visits, monitoring of registry books (APE-CA-1), and receiving feedback (APE-CA-2). Some APEs reported receiving more supervision as a result of the pilot intervention, whereas other APEs reported similar supervision as before the intervention. Half the APEs expressed satisfaction with the supervision that they receive. The other half indicated they would like to receive supervision at least twice per month, and specifically to be observed and receive feedback on their performance.

2B: Quality

Overall, providers were satisfied with the intervention. Specifically, health facility providers were satisfied with the support, knowledge, and materials received. Providers highlighted new tools that PATH provided ranging from manuals, job aids (e.g., posters, pamphlets), diagnostic tools and equipment (e.g., MUAC tape, weighing scale, teaspoons for administering medicine), and monitoring tools (e.g., referral forms).

I think that PATH´s intervention is advanced because of the tools that are being used, here in ADEMO we used to have manuals but they were not as detailed as these ones we have from PATH, the tools we received from PATH help us a lot when we get in to the community and discover problems around the disabled child, we are able to discover some illnesses that these particular children have because the tools we are using are very explicit. With that, we can refer to the child fast and improve the condition of that child very easily. (ADEMO-MS-1)

Health facility and community-based providers both commonly indicated nutrition as one of the most important topics.

Interviewer: What are the topics that are most important?
Respondent: The most important topic is nutrition. This is because most of the children that we are identifying, are suffering from malnutrition, we get very weak children and therefore that is the reason that I am saying that this topic is very important. This is because I did not know, when I entered in RBC, ADEMO ... and then the training with PATH, it is good because most of the caregivers do not understand this at all. (Source: ADEMO-CA-2)

Nutrition, especially for children is very important because this district for example is agriculturally productive, there are some many crops that are planted here but the biggest problem is lack of knowledge on how to take advantage of all these products culminating to the fact that our district is one of the districts with the highest rate of malnutrition, this does not make sense given that it is also one of the districts that produces a lot. The topic of nutrition even when I talk to people they pay greater attention. (HF DIRECTOR-MS-1)

Moreover, providers believed that caregivers too perceived messages on nutrition as important and useful.

Interviewer: What topics to the caregivers in the community like learning about?
Respondent: It is this of environment hygiene they do like. The one on nutrition they do like. Mothers especially like nutrition. In the past, the children were always weak and now they are seeing that this is helpful to address the issues causing this.
(APE-CA-1)

Interviewer: What information do they [caregivers] like to learn?
Respondent: Topics related to nutrition, when and how to feed their children. They like learning how to prepare enriched porridges, they have the food at home but do not know how to prepare it. (MCH NURSE-MR-2)

They like hearing about how to feed your child. They always bring up the issue of child feeding during our discussions, saying that they do not have what is required to feed their children. We always tell them that it is not a matter of buying food from big shops and supermarkets for

your child, you should make use of what you have at home and make it nutritive for your children. The caregivers are very engaged in such discussions. (CCS TECHNICIAN-MS-1)

While nutrition messages were the most prominently mentioned, health facility providers (and particularly the health facility directors) also shared how ECD messages were acceptable and relevant to both themselves as well as caregivers. Many specifically highlighted that this was a new topic learned as a result of the program and was shifting cultural norms, including the engagement of fathers in promoting ECD.

Interviewer: What do you enjoy most of this intervention?
Respondent: Early childhood development and delay in psychomotor development. As I said, first; I like working with children, if you like working with children, and if you realize that yesterday, I was not doing this, I did not know how to do this, and today someone tells you, this is how this is done, this is a reason for you to continue liking it, this is the reason for you to continue embracing this, so that you do not leave it to chance and ignore it so that you will not forget. (HF DIRECTOR-MR-1)

Before, the mothers they never…how can I put it…they never used to respond well on early childhood development and we did not on our side know how to explain. When the project started, that is when we started being trained on what to do, how to explain and we have managed to explain. (CCD TECHNICIAN-MS-1)

In particular, a health facility director highlighted information acquired about the importance of and links between nutrition and child development. Another health facility director noted greater attention and screening of children not only at-risk of malnutrition, but also developmental delays. A CCD nurse described how program materials and resources for ECD (i.e., child development milestone poster) were helpful for explaining concepts to mothers.

Our community did not have in their mind that a child has to play with the parents, they did not have in their mind that poor diet for the child today will affect the child's development tomorrow. With the introduction of PATH there has been training for APEs, activistas, and in turn they took the message to the community and told them, look here, this child is yours but you need to play with him, please make toys for him/her, her/his diet should be this and that so that the child can grow in a healthy way. This has improved malnutrition cases and cases of development, this is decreasing also the delays in child development. (HF DIRECTOR-CA-1)

Nurturing care for early childhood development was not [previously] my priority. It is obvious that I know how to identify a child who has problems relative to growth however, the details and care of walking with the mother of the various steps and things needed for their baby's growth, but to tell the truth I did not think important. When the project arrived, the focus was to show us all the tools that we already had that could be used to help early childhood development, in our mind though we had these instruments, we did not regard them as important, they really started by telling us that we have the tools and just wanted to know what follow-ups we do relative to early childhood development. Indeed, when we reviewed, we noted that we never used to do. (HF DIRECTOR-MS-1, HF Director)

I liked most putting into practice some of the information. For example, explaining to the mothers some of the steps of the child development using the poster on the wall or the toys,

which makes it easier to explain and also draws attention of the mothers on the posters and what they imply. I think it is easy for them to understand when we talk and demonstrate. (Source: CCD TECHNICIAN-MR-1)

Among those who highlighted the importance of ECD, providers shared that messages about toy making were most commonly enjoyed by parents. Providers believed messages about toy making were especially captivating to caregivers because of the novelty factor and feasibility. A handful of providers also highlighted how stimulation messages (e.g., playing, communicating, and teaching new concepts) were also enjoyed by parents. However, engagement in stimulation was mentioned less frequently.

The topic they like most is playing with the children. They did not know that even a child in the womb, you can still talk to him or her. They did not know that a child with only two months, you can start educating him/her to at least for her/him to know that this is a car, this is a pen, the child then grows while knowing. They used to say that in the past they did not know about this and they used to leave things to happen naturally and that the child would know on his own if this is a pen for example. (HF DIRECTOR-MR-1)

Community providers also mentioned that they themselves as well as caregivers enjoyed nutrition and ECD messages, although ECD messages were mentioned less consistently across all the community providers than health facility providers. Notable examples are highlighted below.

I like talking to a pregnant woman about the diet of the baby, I like when I talk about playing with the children, and I like when I explain about food for children and the four groups and their functions. (APE-MR-1)

The parents like most learning about the functions of early childhood development specifically on the usage of toys to stimulate a child, they like to learn because when we recommend to them to make toys at home for their children, they normally do it. Especially for those parents who do not have a high purchasing power to buy manufactured toys from the shops, we explain to them how to make a toy, we tell them that it is not only the toy from the shops that can serve the purpose with a child but it can also be a toy made from local materials… I think it is helpful because as a caregiver, they learn another way without cost implications, and through our experience, which we transfer to the father, he can produce the toy without any cost implications. (COVida/AMASI-MS-1)

2C: Barriers and facilitators

Providers highlighted how helpful the practical (e.g., provision of job aids) and technical support (e.g., supervision) received from PATH and local supervisors were in enabling them to provide the necessary services to their communities.

The results are positive. This is because first, I register the children who are malnourished and I follow-up to see whether there are any changes. In the past, I was just suspecting, seeing a thin child and I used to say that was because of nutrition, but now no. I have the material that I use to measure the children from 3 months to 5 years to see if the child is eating well or not. (APE-MR-1)

At the same time, several health facility and community providers mentioned that they lacked the necessary resources (e.g., infrastructure, personnel, training) to adequately fulfill their responsibilities. For example, both a health facility director and a CCS technician shared that some health facility providers were not motivated to carry out all their responsibilities, and this was partly due to the increased responsibilities associated with the intervention. A few health facility and community providers also shared that they did not have the necessary capacity to care for sick children. Relatedly, they highlighted how caregivers lack the resources to afford transportation to clinics or follow through with their referrals. Proposed solutions to these challenges included more training of providers, particularly in sensitizing them to the importance of the intervention for families' wellbeing and investment in more personnel to support new activities.

One of the challenges is with us health service providers, we like leaving things to happen on their own time. We are not committed to our work. When I was trained and request to come and train my colleagues here, when I tried to organize a training, no one would show-up. They also say that things related to early childhood development are not in their terms of reference, because they were not included in the training lists. This should not happen, we need to be conscience that early childhood development activities are not for PATH or the caregiver, it is the responsibility of every health service provider. (CCS TECHNICIAN-CA-1)

Interviewer: Are new challenges in your role and responsibilities since the pilot project came aboard?
Respondent: Yes, there are. I would like to request for more nurses, when this place is full with caregivers it is very challenging, because I have to work alone in three different departments. (MCH NURSE-CA-1)

There are others that say, hiiiii I do not have money … please treat me here. However, there are diseases that I treat at home, other diseases I cannot treat. For example, this mother with the child who had convulsions, I could not treat her, I cannot. They only complain about lack of money for transport. I have to sensitize them to go, because that type of the disease I cannot treat in the community. (APE-CA-2)

Language difficulties was also mentioned as hindering some providers' ability to deliver the intervention to caregivers. One nurse shared that she was not fluent in the local language and therefore relied on one of her colleagues to counsel those caregivers who only spoke the local language. Therefore, it is worth considering how to ensure that both providers and caregivers are able to fully and clearly communicate and discuss all key messages (e.g., nutrition, health, ECD) without language barriers.

Finally, health facility providers in particular noted the issue of weak linkages between health facilities and community activists. Specifically, they shared that a lack of communication between health facility and community providers caused challenges with following up on at-risk children who require further support and elicited broader concerns about continuity of care after children leave the health facility and return to the community.

The main challenges are these referrals. For us, we are scratching our heads on how this could be resolved. We have already sent a plan to District Directorate for some help

especially once per week to facilitate this follow-up of the children [with disability] whose parents have challenges due to lack of money. So, one specialist could at least be sent here on a weekly basis so that at least follow-up could be done for these children. This is one of the most difficult challenges we have. (HF DIRECTOR-CA-1)

In terms of perceived barriers to caregivers, providers identified lack of money being a prominent barrier to nurturing care behavior change. Various providers shared that caregivers expressed not being able to implement some of the messages due to lack of money to buy food, pay for transport to seek care at health facilities, or buy medication.

My challenge is when I make a referral to a certain hospital and the family members complain about the distance they have to walk as the means of transport are scarce and expensive to many families here. Many times, the families are unable to go to the referred hospital due to financial challenges. (MCH NURSE-MR-1)

Another perceived barrier to caregivers' behavior change was caregivers' distance to the health facilities. This was an issue both because of the lack of money to pay for transport and the amount of time and effort needed to reach these health facilities. Providers realized that many caregivers were unable to follow up with the necessary services for their children because the health facility was too far from their community.

Distance [to health facility] is a major factor that makes it difficult for the caregivers to do proper follow up for their children´s rehabilitation process. Most of the time caregivers give up because of the distance from the community to the health facility. (CCS TECHNICIAN-MS-1)

2D: Perceived changes

Overall, providers reported significant positive changes as a result of the program – not only regarding their own knowledge and skills for supporting nurturing care as aforementioned, but also among caregivers, children, and the health system more broadly.

With regards to caregivers' behaviors, providers most commonly mentioned improved caregiver knowledge of child nutrition and age-appropriate complementary feeding of young children. Providers highlighted how they were able to correct inaccurate beliefs and cultural norms about certain foods for children (e.g., egg and meat) and some parents providing more of these foods to their children.

I have observed some changes in some families regarding some issues that used to happen when it came to food. Whenever they bought some nice fish, eggs or had milk at home, those meals were exclusive to the father and children were not allowed to touch. Whenever I was present during such a situation, I would sensitize the family to abandon such attitudes and today they are now giving priority to the children when it comes to food. (COVida/AMASI--CA-1)

Moreover, providers frequently highlighted parents' preparation of enriched porridges, as recommended.

With regards to ECD, providers reported that parents began making toys for their children using homemade materials. The extent and manner by which caregivers engaged with their children using these toys was not clear, as providers mainly described increased provision of toys but did not elaborate much further. Nevertheless, a number of providers reported how some caregivers did engage in more communication and play with their children.

Playing with the children is an important topic that personally I have noted that it has brought many changes for our children in our communities. This is because, I will use myself as an example, I am from this province and I grew up in this environment and I have never given any importance of playing with young children. It is part of the culture of our community thinking that playing can only be done by children and it is not part of the adults. This intervention has also insisted the importance of children playing amongst themselves and also not limiting a young child from playing, for example, if someone is at your house then limiting your child from playing because they will make the place dirty, therefore some children are limited to play and this can cause delay in their phases of growth. Through this intervention, when we insist that the father and mother should talk to a child while still in the womb, they think we are talking of things from another world and this a good example that indeed this was not part of the practice for many caregivers in the community. Playing with the child then should start when the baby is inside the womb of the mother, this is a very important intervention. (HF DIRECTOR-MS-1)

In particular, a handful of providers specifically noted greater father involvement. Providers described examples of fathers becoming more attentive to their wives, spending more time caring for their children, and reported observing a few more fathers accompanying their partners and children to health facility visits.

Interviewer: Since the beginning of the intervention up to now, have you observed some changes within the families?
Respondent: It was difficult to see a father carrying their child on their back on their way home from the farm with his wife. The women used to carry the firewood, the child, and the tools. They used to say that the child belongs to the mother. Today that has changed, the fathers have been sensitized and changed their behaviors they now carry their children and even play with them. (COVida/AMASI-CA-1)

In response to whether there were any perceived improvements at the child-level, providers gave more examples of positive impacts on health (versus developmental) outcomes. Those providers who did mentioned changes for ECD primarily described so from the perspective of reducing cases of developmental delay. *"Yes, there are changes, we have children who could not walk and today they are walking, there are children who could not sit and now they can, the malnourished children are now gaining the desired weight and growing well." (ADEMO-MS-1)*

Finally, beyond perceived changes to caregivers and children, providers emphasized improvements at the health system level. Both health facility and community providers highlighted increases in referrals made by community providers and overall greater participation of caregivers at health facilities.

First after the introduction of all these topics, we are now able to get a lot of referrals of mothers to the health facility. They say, "My child is not eating like he/she should eat." We are having an influx of mothers consulting and this for us is good, because it shows that we

are working. Relative to the APEs, we are having a lot of referrals in this area and this means they are also paying attention that if this child is not ok, he/she has to rush to the health facility before the condition worsens. Another success is on the side of the health worker that we are now paying attention that is integrated linked to a child. Instead of focusing on one, nutrition, delays among others. (HF DIRECTOR-CA-1)

In addition to referrals, providers described a greater integration, streamlining, and restructuring of services at some facilities, or a "one-stop-shop", where caregivers were triaged upon arrival at the health center to determine the most appropriate care. For example, a provider shared:

Before, I used to tend to the pediatric unit, I used to wait for the [child health] cards, however after the training, we have created a one stop shop where all the technicians from CCD, CCS, CCR meet together. We identify all the cards and after weighting the mothers are sent to respective sections. At the one stop shop area, everything is done including giving the children vitamin A, everything is done at the one-stop-shop area, so if the child is here with a case of, for example,malnutrition, we undertake monitoring, this has changed and our work has been made a little bit easier. We created a one-stop-shop where every health technician meets and identifies his/her own cards according to the mothers' necessities. Everything is done over there and later they come to our [consultation] doors for specific cases. (CCD TECHNICIAN-MR-1)

This increased efficiency contributed to reduced waiting times at health facilities, which several providers highlighted as another positive change in service delivery.

They [caregivers] are very satisfied due to the reduction of waiting time and attendance. The time they take at the health facility has really reduced. They are happy because they no longer spend a whole day in the health facility during their consultations. They are now attended in one room regarding all the issues they bring with them to the health facility. There is no need to move around from one place to another. Once they are attended, they go back home early to continue with their other activities. Even counselling is done during consultations. (MCH NURSE-CA-1).

Section 3: Caregivers' experiences with the pilot intervention

3A: Messages received

Overall, caregivers reported receiving nurturing care messages primarily at the health facility, compared to community-based services. Below in order of relative influence, we further unpack caregivers' exposure to nurturing care messages from each program component and the specific types of messages received from each source, starting with the counseling from health facility providers and concluding with media campaigns at the community-level.

Counseling from health facility providers

Of the health facility-based program components, counseling from providers was the primary source of nurturing care messages. All caregivers expressed receiving at least one nurturing care message from the health facility provider during their consultation. Messages about optimal **infant and young child feeding practices** were most commonly reported by caregivers across all three health facilities. Caregivers consistently shared how health facility providers emphasized the importance of exclusive breastfeeding and introducing solids after children are 6 months of age. The vast majority of mothers also highlighted learning about an enriched porridge recipe involving a mixture of cereal with peanuts, vegetables and greens (e.g., moringa leaves), and coconut, and avoiding cassava flour and reducing sugar.

He said, that I have to make porridge with peanuts with cereal flour and a little bit of sugar and give her to eat, I could also make the porridge with coconut and if I have money I could buy for her juice, eggs and fruits. (MOTHER-HOME-CA-2)

He told me if I could buy corn meal, and I should prepare the porridge and mix it with peanuts or moringa and stop giving him the cassava flour, because he is still too young for this type of food…. [I learned] not to give the child cassava flour while he is in this phase. At least I have to wait for him to turn 1. I also knew that the child should eat porridge mixed with peanuts because it makes him grow healthy to get an acceptable weight. (MOTHER-HF-CA-5)

Among older aged infants, caregivers also frequently recalled the importance of providing other dietary diverse foods to children – specifically mentioning sweet potatoes, eggs, green vegetables, pumpkin, and fruits (e.g., banana, papaya).

Messages about **maternal and child health** prevention and treatment were the next frequently mentioned category of messages received. Caregivers recalled receiving information and advice about various health issues: malaria prevention by having children sleep under a mosquito net, appropriate treatment for child fever, bathing and management of child hygiene, regular health facility visits for routine well baby checkups (e.g., to complete vaccination schedule) and sick child consultations, maternal HIV testing, family planning methods, and water treatment and handwashing.

He was saying that I could not give water to my son in any way, these pains could also derive from water, especially when we are taking it out of the well or from the tap. He also said that I should start boiling water and put certeza for sure it could prevent many other diseases. Most

of the times I give him water from the fountain he refuses to drink it because it is salty. (MOTHER-HOME-MR-4)

He advised me to do family planning, because I need to avoid becoming pregnant while having a small child and he said I have to wait for the child to grow up before getting pregnant again. (MOTHER-HF-MR-4)

More generally in the context of health prevention, caregivers also frequently mentioned receiving messages from providers about **COVID-19** and specific prevention measures such as wearing face masks whenever leaving the house, maintaining social distancing, and handwashing using soap or ash.

Approximately half of caregivers mentioned learning from providers about the importance of **parenting activities to increase early learning opportunities and ensure safety and security** for ECD. Among the caregivers who reported receiving these messages, several different engagement activities were highlighted, including the importance of playing and communicating with their children beginning in the womb and making toys for children using objects and materials available at home.

I talk to her about things in a normal way. This is because they already told me at the hospital to talk to her since she was in the womb. And now that she is growing, the conversation still continues. We normally talk to her "give me bread, see mama, go call your brother, take the cup, drink water" and other things. We also have her toys or dolls. She likes to help me wash the dishes and she likes playing in the kitchen. I play with her using coconut shells. There are other things that happen, but she likes to play [smiles…]. The truth is, we have this book that has a lot of images and she likes playing with this book. She takes this book and comes to give me to open for her and she points to the images happily. (MOTHER-HOME-CA-3)

In addition, I understood that I can and am able to make some toys for my son with the things we have here at home. I am able to make a toy car using a plastic bottle and since my son is still young, it does not matter for him if I make a doll with clothes, he will still like it. (MOTHER-HOME-MS-1)

In addition to stimulation, a few caregivers highlighted the importance of providing a clean physical home environment for children to play as well as avoiding harsh disciplinary practices. For example, one mother shared, *"I learned that we should not shout at children, we should not call them ugly names or animals. We should love them." (MOTHER-HF-MR-1)*

Media and visual resources at the health facility

Following direct counseling received from health facility providers, the second most commonly specified source of nurturing care messages was from media and visual resources at health facility, which collectively refers to TV messages received the waiting areas of Monapo Sede and Carapira health facilities and radio messages and posters observed in the waiting area and, in the case of posters, also in the counseling room of all three health facilities. A radio was

observed in Monapo Sede and Carapira, but not in Monapo Rio. Nevertheless, most caregivers across all three health facilities mentioned hearing a **radio** while waiting at health facility. Although the majority of caregivers reported hearing about COVID-19 prevention on the radios, fewer parents described hearing messages about nutrition (e.g., recipes) and parenting (e.g., talking to the baby in the womb). Specifically, these nurturing care radio messages were only mentioned by caregivers in Carapira and Monapo Sede, and not in Monapo Rio.

This radio was talking about different ways of raising a child, that we should prepare banana smoothie, cereals porridge and make toys, we should play with our children, we should leave a child play with anything they like with the exception of knife, fire and we should pay close attention. We should talk to the child in the womb because he/she hears. Using masks, washing hands always to protect ourselves from corona virus. (MOTHER-HOME-MS-1)

In fact, one mother mentioned learning about fathers' involvement in stimulation from the radio messages and shared how this was new information to her:

The technician turned on the radio and they were talking about hand washing, it also said that a father should play with his son, from the moment he is in the mother's womb. For example, I did not know that the father can play with his son from the womb, I knew it from on the radio. (MOTHER-HOME-CA-6)

Based on 3 observational visits on separate days at each health facility (9 total), a radio was observed at two out of three health facilities. At these two facilities with a radio, observers noted the radio was turned on and broadcasting messages at some point only during half of these visits (3 out of 6 days). Observers noted hearing radio messages about COVID-19 prevention and nutrition. On the third visit to one of the health facilities, the observer noted that the radio was suddenly brought into the waiting area and switched on moments after their arrival, most likely because the provider realized this was being observed. At both facilities, observers noted that caregivers were not paying attention and noted concerns at both locations about the placement and volume of the radio. To possibly improve the effectiveness of radio, observers suggested the radio be moved to reach those waiting outside and so as to not clash with the TV that is also broadcasting inside.

Radios at Monapo Sede and Carapira health facilities.

Posters were another reported source of nurturing care messages at the health facilities. Again, although approximately half of caregivers recalled observing posters across all three health facilities (both in the waiting area and in the counseling room), most only recalled seeing posters pertained to COVID-19 prevention messages.

Interviewer: What did you observe while you were in the waiting room?
Respondent: I just saw glued papers that talked about Coronavirus, the other papers already had been removed. There were only those that show how to wash hands, how to keep the distance between people. (MOTHER-HOME-CA-6)

Interviewer: Have you ever seen any posters where you were waiting to be attended?
Respondent: Yes, everything was about COVID-19, I am not sure if there is anything else on other posters other than Corona. (FATHER-HOME-MR-1)

However, a few caregivers from Monapo Sede and Carapira recalled observing pictures in waiting areas that spanned early child development milestones, fathers' involvement in childcare, breastfeeding, diverse foods to feed young children, children being vaccinated and weighed, and ensuring a safe home environment for children. For instance, the following caregiver detailed how the provider referred to and used posters during their consultation.

At the hospital, I normally see a lot of images on the trees and the walls, I do not know how to read so that I can understand. I understood the drawing about Corona virus that shows washing of hands and use of mask. There is a drawing of a mother giving food her child, drawings of fruits that are good to give the baby. There is an image of child and the nurses explained that that image wanted to tell us that we should take our children all the time to the health facility. There is another one they explained that when the child completes 6 months without crawling, that child has a problem and from 9 months to so months, if a child does not to stand standing up using support, then there is a problem and we need to go for control. They talked also about social distancing because of Corona virus. (MOTHER-HOME-CA-2)

Observers noted posters were displayed at various locations of all three health facilities: inside the CCS, CCD, MCH consultation rooms, in the enclosed waiting areas, outside waiting areas (i.e., posted on trees), and the exterior walls of the health facility. Indeed, most observed posters pertained to COVID-19, but posters on family planning, danger signs for healthcare seeking, vaccinations, nutrition, developmental milestone, and stimulation activities were also observed across all facilities. At all facilities, observers noted that most caregivers did not look at any of the posters, and no one guided caregivers to look at least those posters placed in public areas. Observational notes included suggestions for posters to be placed in more strategic locations to reach more people, such as in the outdoor waiting areas where more people spend their time rather than inside where many were placed quite far away from where patients were seated.

Examples of posters at Monapo Sede, Monapo Rio, and Carapira health facilities.

Additional examples of posters at Monapo Sede, Monapo Rio, and Carapira health facilities.

Lastly, **TV** messages were the least commonly mentioned media source. Only a few caregivers at Monapo Sede reported having observed video messages from the TV. Those who did mentioned seeing a cooking demonstration of how to prepare the recipes for porridge and learning about the importance of stimulation activities and safe home environments for young children.

In the video, they were demonstrating on how to make enriched porridge with maize meal flour and grounded peanuts. The other information was on how to take care of the baby…. The last time I went to the hospital there was a video demonstrating how to prepare enriched porridge and I would very much like to know how it is done. I was not able to watch because the nurse had already attended me and I was in a hurry to get home. (MOTHER-HOME-MS-1)

I saw a video that showed a father playing with his child, and that a child should never play with a razor blade, knife or leave the child playing with anything that could cause harm to the child. That is what I saw in the video. (MOTHER-HOME-MS-6)

The remaining caregivers at Monapo Sede and nearly all caregivers at Carapira either did not recall ever observing a TV at the health facility, mentioned that the TV was not turned on, or was playing a non-intervention related message (e.g., the local news).

Observers noted that two out of three health facilities had a TV (the same two which had electricity and where radios were also observed). Out of the 6 observations conducted at these two facilities, the TV was turned on and broadcasting messages at some point during only two of these visits. On the 4 other visits, the TV was turned off and not playing anything. Observers noted educational skits of what appeared to be an activist counseling mothers in the local community context. In both instances, the observers themselves could not describe what was being displayed because they could not hear the skit due to the low sound and the loud surrounding noise in the waiting area.

Observers noted that the vast majority of caregivers did not watch or glance at the TV when it was broadcasting. Only one mother was ever observed as paying attention. The observers noted similar concerns as the radios, regarding poor placement and inaudible volume due to the noisy environment of children crying and nurses talking with mothers. Observers suggested that the TV at both facilities would be more effective if placed in another location, or more specifically unobstructed behind steel bars, separate from where the radio was also playing, and separate from "the action" where children were being weighed and vaccinated, and potentially in another waiting area where more patients could be reached.

TV at Monapo Sede health facility.

TV at Carapira health facility

Counseling from community providers

Caregiver reported limited exposure to nurturing care messages from community sources. The majority of caregivers had never heard of the various community activist groups (i.e., APEs, ADEMO, AMASI), which is expected given APE geographic catchment area and ADEMO and AMASI's focus on specific vulnerable groups of children. Only four caregivers mentioned a personal experience with an **APE** and those who did reported receiving messages about family planning, infant feeding, and COVID-19 prevention from APEs. Of these four caregivers, none specified receiving messages pertaining to stimulation and caregiving for ECD from the APEs.

They [APEs] advised me to take care of the child, when he is sick and send them to the hospital. With this new disease that we have now, they said that I always have to use the mask, to wash my hands with soap, to be away from people. They said I have to feed the child well, and if I do not have the money to buy cerelac flour or other porridge, I have to get sweet potatoes to boil that potato, peel that potato and give it to the child. Before talking to them, I did not know that if I do not have the porridge, I could mash the sweet potato and give it to him. Now if I don't have porridge, I buy sweet potato and prepare it before giving it to him. (MOTHER-HOME-MS-7)

I have received some advice from them [APEs]. They talked about the care to be taken with children, how to maintain a healthy diet for the child, hygiene and how to treat the water, do family planning to avoid becoming pregnant while breastfeeding, continue to give the baby food mixed with peanuts and continue to give breast milk, giving fruits such as papaya, bananas, as this is good for the child's health. If possible also cook an egg. They also talked about cleaning the house as the child should not play in dirty places. (MOTHER-HOME-MR-5)

Although the majority of caregivers did not know about community activists, when further probed, they consistently expressed a desire to receive visits and learn from APEs.

Interviewer: Have you ever heard about the APEs?
Respondent: I have never heard.
Interviewer: Have you ever been counselled by an activist?
Respondent: No, I only receive information when I go to the hospital.
Interviewer: Would like to interact with them?
Respondent: Yes, because that would help us change our behavior, I only hear the educational talks when I go to the hospital, I miss a lot of information that is why it would be very good if they came to this community." (MOTHER-HOME-CA-1)

Caregivers also had limited interactions with **AMASI**. Again, most had never heard of these activists and were unfamiliar with their role in the community. Only two caregivers had any experience with AMASI and detailed their role in water treatment and storage.

Interviewer: Have you ever heard of water consumer educators [AMASI] association?
Respondent: Yes, sometimes they come here in the community. The last time they were here they showed a video about cholera where they were showing two buckets with water, in one of the buckets they put water purifier and they did not put in the other one. It was then explained that between the two buckets only one was safe for use and the other could not be used because the water was dirty. We should also cover the buckets the have water to keep away insects and dirt because it is harmful to our health. We were also taught how to use a water purifying agent "Certeza" used to make water safer for use. (MOTHER-HOME-MS-1)

Caregivers were the least familiar with **ADEMO**, with only one caregiver aware of this activist group. This mother shared how she was familiar through her neighbor who received support from ADEMO. "They [ADEMO] help people with disabilities. For example, I have a neighbor who has 4 children and they all do not walk and this association is helping them a lot." (MOTHER-HOME-CA-6) As stated above, limited reported contact with AMASI and ADEMO may be due to the fact that target beneficiaries of these particular community activists (children affected by HIV or disabilities) were not specifically sampled during caregiver selection.

Although few caregivers were aware or had personal experiences with any of these three community actors (i.e., APE, AMASI, ADEMO), a handful of caregivers did describe receiving some type of nurturing care information from a community initiative/activist. However, they were uncertain of the exact activist group and described them more generally as government campaigns or nurses from the health facility.

There is a place there, but it is at the political party, they usually come to visit with a car from the hospital with some nurses, and come to advise us. It has been the neighborhood secretary. They talk a lot about Coronavirus and family planning. They talk about taking care when the child is sick and immediately going with them to the hospital. When the child is sick, we should not leave the baby with other children to be taken care of. (MOTHER-HOME-MR-4)

Here in the community, I have seen the activists from FDC [community development foundation], counselling on the use of condoms. There are so many diseases, how to take care of your child, they give a lot of counselling and educational talks also on child's hygiene, personal and environmental hygiene. We should wash vegetables and fruits very well especially those that are eaten raw, we should not cook our food in a dirty pot and we should cook our food well. (MOTHER-HOME-MS-2)

Media campaigns in the community

Finally, caregivers' exposure to nurturing care messages via media campaigns in the community was also limited. Roughly half of parents shared that they had never heard any information pertaining to the care for young children through radios played in the community. The remaining half heard radio messages only about COVID-19 prevention measures, but not nurturing care practices. Only a few caregivers in specifically Monapo Sede and Monapo Rio reported hearing messages on the radio pertaining to child feeding and stimulation practices. We highlight examples of these exceptions below.

Via the radio, I hear programs about health and life, there is a program of knowing about children, and the program infancy garden. These programs highlight more about children and the children's health. They teach about how to live together with the child on a daily basis. They used to tell us that we should not give to the children like eggs, fish. We are now surprised that we can give these foods to the children and they do not harm them at all. We are surprised to know they are even beneficial to their health, we can give the children potatoes, pumpkin, and if we change the diet for the children this is good for them because it helps with their development. (FATHER-HOME-MS-3)

Respondent: Almost every day on the radio I listen to at the neighboring house or even on my phone, because here in the community they appear once a week on Fridays. They have shown up and sometimes they do not show up for two weeks. I learned a lot of things, how to play with my son, how to take better care of my son, how to give the best food such as fruits and porridge mixed with peanuts.....
Interviewer: Have you ever practiced the messages or advice received in radio campaigns?
Respondent: Take care of my son, and as I see this car I bought it here in our community. These are cars made with local material and this helps my son to identify certain things and contributes to his mental health. I have put certain stones in a can and I start playing with it and it also distracts my son. It is a pity that the Moringa is now finished, I like using it to prepare porridge to give it to my child because he likes it as well. (MOTHER-HOME-MR-5)

3B: Acceptability and satisfaction

In this section, we describe caregivers' perceived acceptability and satisfaction regarding program-related messages and services. Considering how most caregivers were only exposed to the health facility-based program components, themes below are largely based on caregivers' experiences at health facilities (i.e., counselling from providers and exposure to media).

Health facility-based program components

Beginning with waiting time at the health facility, caregivers' experiences varied widely with some caregivers reporting waiting as short as 10 minutes and other caregivers reporting waiting up to 6 hours from the time they arrived. Most caregivers reported waiting approximately 2-3 hours. Of note is that this time included the time waiting for the health facility to open: most caregivers arrive at 7 am, a full hour before health providers usually begin seeing patients. A few caregivers reported arriving at 6 am, and one reported arriving at 5 am. Overall, most caregivers

were seen by noon, with a few leaving as late as 1 pm or 2 pm. Waiting time did not vary based on the type of consultation (i.e., CCD or CCS visit). However, data suggest that waiting times may be somewhat longer at Carapira. Generally, those caregivers who did not wait long were satisfied with the waiting time, whereas the majority who expressed waited a relatively longer time preferred shorter waiting times. Once attended, most caregivers reported that the provider spent about 10 minutes with them in the consultation. This suggests that time for developmental monitoring and counseling at the consultation may be minimal.

Overall, caregivers perceived the messages received at health facility as acceptable and useful. Specifically, caregivers found nutrition counseling and advice about how to make toys for children especially useful.

For me, the most important message is the porridge mixed with moringa or peanuts and I will stop giving cassava flour. If I continue to give this cassava flour it will be only in a case of extreme need, that is, in the absence of resources. (MOTHER-HF-CA-5)

Interviewer: What information did you get at the hospital that was useful?
Respondent: What I remembered was of the making a toy with stones in a tin, so that it could shake it for her, I normally do it for her and she likes it
Interviewer: Why do you think is helpful for you?
Respondent: Because I do not have money to buy toys. (MOTHER-HOME-CA-4)

Moreover, caregivers were satisfied with and positively regarded the interpersonal counseling skills and relationship dynamics with health facility providers. When asked as part of the caregiver exit interviews, several caregivers highlighted their satisfaction with providers' demonstrations as part of the counseling, the repetition of key information, and the opportunity to ask questions when messages were unclear. This quality of care was highlighted as enabling them to better understand the providers' advice, foster trust, and a desire to receive care again from the same health facility provider.

I would go back to receive services from this provider because he served me well and respectfully. He even played with my son. He lifted him and made him stop crying when he was crying there inside. He never got angry with me or with my son. (MOTHER-HF-MR-1)

Among those who did report observing these sources, caregivers (including a father) expressed satisfaction with the posters, videos, and radio spots at the health facility. Specifically, videos were perceived as easy to understand and informative.

What I saw from the video was something beautiful. I understood that what was been said was true. Such things happen in our homes, the information was very clear and direct and I was able to understand. (MOTHER-HOME-MS-6)

I think they [posters] had good messages. I am saying that because they taught me to understand that my wife also needs my assistance. I clean, I give bath to the children and wash clothes when I am at home. (FATHER-HOME-MS-3)

While most caregivers found the services at health facilities acceptable, others noted some program components that could be improved to increase acceptability. Several mothers and

fathers mentioned that they were unable to comprehend some of the radio messages at the health facility because they did not speak or understand Portuguese. Consequently, caregivers suggested that having program messages in Makua (local language) would make services more acceptable and ensure that they could understand.

> *I did not understand anything [from radio] because they were speaking Portuguese and I do not understand Portuguese. They should speak Makua for us to understand. Many people here they do not know Portuguese only the nurses that know how to speak Portuguese. (MOTHER-HF-CA-1)*

During the review of initial findings, PATH implementation field team explained that these messages were likely referring to COVID-19 messages or other content that was received by the national government or another national NGO because all nurturing care radio and video messages were recorded or dubbed in Makua.

Finally, both male and female caregivers noted how male caregivers were less engaged in parenting and childcare responsibilities, with some caregivers particularly highlighting how they would like this to be addressed more as part of health services for young children. This was particularly salient in the health facility context, where many caregivers noted that male caregivers rarely took their children for health visits. Reasons for this ranged from cultural and gender expectations and norms that women were the sole caregivers of children to male caregivers lacking the time to accompany their children to health facilities due to their work obligations:

> *Most Mozambicans do not have the habit of taking our children to the hospital. We like to leave everything to the mother of the children and I think that is not good. Even educating children, this has to start at home, some men when their children have urinated on their diapers instead of changing the diaper they take the child to the mother for her to change it. When I went to the hospital, I only saw one man who had taken the son to the hospital, all the others were women." (FATHER-HOME-MR-1)*

Caregivers suggested solutions to overcoming this challenge that included sensitizing male caregivers to increase men's engagement in partner and parenting responsibilities and even incentivizing male caregivers to also attend child health visits by serving men first when they do arrive:

> *Interviewer: What do you think should be done so that there are more men who accompany their children to the hospital?*
> *Respondent: They need to be sensitized that the fathers can also go to the hospital with the children or together with their wives in order to help them. (MOTHER-HF-CA-1)*
>
> *Interviewer: What can be done to increase the father's attendance at the health center?*
> *Respondent: Always give priority when they come to the hospital. (MOTHER-HOME-CA-5)*

Community-based program components

As previously mentioned, caregivers were not purposefully selected based on their contact with community services. However, among those caregivers sampled for our study, few reported

receiving community-based counselling from APEs, AMASI, ADEMO or other *community actors* or having exposure to community-based radio messages. Thus, we could not capture a complete understanding of caregivers' perceived acceptability and satisfaction about community-based components of the program. However from our sample, several parents highlighted the limited access to and availability of providers and services at the community-level and believed this was a shortcoming of the district health system.

> *Very few people get this information [from activistas]. The challenging thing is the opportunity to have activistas with us here in the community." (MOTHER-HOME-MS-6)*

Of the few who did mention an experience with community-based program components, one caregiver expressed their trust in community activists and radio campaigns.

> *Interviewer: Which source of information do you trust most?*
> *Respondent: I trust the radio, and the activists because they help me a lot. Because this is my first child and I really need to learn about the precautions to take to my child grow healthy. (MOTHER-HOME-MS-7)*

Little else emerged in terms of perceived acceptability and satisfaction with community-based counselling or media.

Among those who reported exposure to both health facility and community-based services, caregivers generally preferred health facility counselling. One caregiver found community campaigns rushed: *"For me all, but at the hospital it is much better, because here in the communities the campaigns have been carried out in a rushed manner and the messaging have been a short." (MOTHER-HOME-CA-6)*. Another caregiver found the health facility counselling more acceptable than community-based counselling or media and particularly noted the positive interpersonal skills of the nurses.

> *The best information source to me is taking my daughter to the hospital. Waiting for the campaigns on the radio and video clubs could be wasting time. The best message I got was at the hospital, because the nurses have a lot of patience. They talk about things very clearly so that we can understand and implement. They talk about so many things and you end up reflecting on child care and well-being. (MOTHER-HOME-MS-6)*

Yet at the same time, those caregivers who reported receiving nurturing care messages both at the health facility and in the community described coordinated and consistent messages between the two platforms. For example, one caregiver shared how she started making nutritious porridge for her child after learning about how to from both a community activist as well as a video she saw at the health facility:

> *I remember one day I went to the hospital my son was not feeling well and there was a video showing on how to prepare the enriched porridge, it then came to my mind that that was exactly what the activists tell us was true, from there onwards I always make the porridge. (MOTHER-HOME-MS-1)*
>
> *For me, I trust messages from all sides, because when these people come here in the community, they speak about the same thing that has been said in the hospital so I trust both parts. (MOTHER-HOME-MR-5)*

3C: Barriers and facilitators faced by caregivers

The most prominent barrier mentioned by caregivers was lack of money to implement the recommended nurturing care messages received. Caregivers expressed that although they were willing to buy the necessary medication and prepare recommended recipes and foods to improve their children's health and development, they were unable to do so due to their current economic conditions:

> *When I went there [health facility], I heard that mosquitoes cause malaria when not using a mosquito net. The nurse also said that we should be feeding our child a balanced diet. My problem is that I do not have the purchasing power to buy the food the nurse was talking about." (MOTHER-HF-MS-1)*

Because of this financial barrier, some caregivers were particularly appreciative of the program messages that did not require them to spend money to improve their child's health and development. For example, one female caregiver shared that she found it useful learning from health facility providers about how to create toys for her child since she did not have money to buy toys.

Another barrier faced by caregivers was a lack of clear understanding on their own of certain messages and how to implement them in their own lives. Although most caregivers did not explicitly state why they were unable to understand the messages from healthcare providers, one female caregiver suggested that receiving demonstrations would facilitate greater understanding and therefore allow her to change her behavior accordingly:

> *The truth is even after listening on the radio I still have some challenges. I would therefore like to participate on a live demonstration to see how this is done. It can be also through the video. (MOTHER-HOME-MS-1)*

Consistent with lack of money being the most important perceived barrier, access to both financial and practical resources were highlighted as key facilitators of implementing the messages received from healthcare providers. For example, one female caregiver shared that even though she did not have enough money she was able to provide nutritious food for her child using the resources she already had from her own home garden:

> *When I saw the posters of the breastfeeding mother, I understood immediately, that is what I normally. The other one with the fruits, I normally do, but lack of money makes it difficult to buy some things. But on a daily basis, it is important to give your child a fruit, it can be fruits if we have in our home gardens, we have to do what we can to give our child a fruit. (MOTHER-HOME-MS-4)*

Another important facilitator was social support networks with other family and community members to discuss matters and receive help as needed. Some caregivers described meeting up regularly with neighbors to remind each other of the messages received from healthcare providers and to share resources amongst themselves:

We are the 3 girls in this neighbourhood that talk. We only talk amongst ourselves but the other sisters do not appreciate this conversation and they say we are just showing off. We talk about family planning, we remind each other of the hospital visits and what we heard at the hospital. We give one another sweet potatoes, coconuts and flour to make porridge for our children." (MOTHER-HOME-CA-2)

I talked to my husband about what I learned [at the health facility], and I also talked to some friends here in my neighborhood, even to my mother. I talked to her about what it was I learned and these are things that she sometimes advises me here at home. So I totally changed my behavior and I see that my son is growing more and more. (MOTHER-HOME-MR-5)

3D: Perceived changes

Changes among parents

All caregivers reported some change in their own behavior towards their child and their parenting and care practices. Most caregivers reported adopting the advice and practices received at the health center, of which nutrition behaviors and practices were most commonly mentioned: exclusively breastfeeding during the first 6 months, preparing peanut porridge, feeding vitamin A rich fruits (e.g., mangoes and papaya), and giving their child scheduled meals. In addition, many caregivers reported improving general care practices, such as bathing their child three times a day, washing their clothes each day, and washing their hands frequently.

Approximately half of caregivers reported playing with their child and making toys from materials at home – though parenting practices were the least commonly discussed in comparison to other topics (e.g., health and nutrition practices). While exploratory and not causal, it appeared that caregivers who attended CCD visits were more likely to describe changes in specifically parenting behaviors for ECD; compared to caregivers who attended CCS visits who were not as detailed or did not mention at all any changes in parenting for ECD. This could be due to the fact that CCS visits, being preventive, are generally shorter and focus on sharing messages as opposed to systematic counseling.

Interestingly, all three interviewed male respondents reported spending more time with their child and specified playing and making toys based on the counseling received at the health facility.

I now know that I need to make toys for my son, not to only be at the market undertaking business. I bought a mosquito net in order to protect him from malaria, I take him to the hospital always when he is not feeling ok. I made a ball for him and I normally see him running with the ball from one place to another. I help my wife to bath him and when I am at home, I normally watch him to see what he is doing, I make toys like a ball from plastic papers, parrot, toy car from reed and I also make some dolls. (FATHER-HOME-MS-3)

We found that nearly all caregivers attributed nurturing care knowledge and behavior change to their experiences with providers at the health facilities. In contrast and even upon probing, relatively fewer caregivers attributed personal changes in response to the posters they saw at the

health facilities or radio campaigns they heard in the community. Any reported changes from these other sources primarily pertained to increased knowledge and awareness of ECD and nutrition and improved practices pertaining to maintaining the child's hygiene, breastfeeding, complementary feeding, and supervision of the child. Of note, these alternative strategies and contexts (i.e., besides counseling from health facility providers) were not a primary source of early learning or responsive care knowledge or practices.

Changes among children

The majority of caregivers also reported positive changes in their children. Specifically, caregivers reported improved nutrition outcomes (e.g., their children were growing faster and gaining more weight), improved health outcomes (e.g., children being sick less often and being clean), yet only a few mentioned improved development outcomes (e.g., children playing more, walking earlier, and being "very intelligent" (MOTHER-HOME-MR-3)). Caregivers largely attributed these positive changes in their children to messages received primarily by nurses at the health facility, though a few caregivers highlighted nutrition and health messages received from community activists as positively impacting their children.

> *Interviewer: What did you think about the advice the health nurse gave you?*
> *Respondent: It was very good, because everything that was said at the hospital I follow as it should be. Now he is very healthy. What I liked the most is when I prepare porridge mixed with peanuts or moringa, he eats very well, even when I buy papaya he likes it a lot and I feel satisfied watching him grow. (MOTHER-HOME-MR-5)*

Changes among other individuals and for the community

Many caregivers also reported sharing what they learned through the various intervention components with others, primarily family members. Caregivers described how as a result other caregivers provided improved care for children. Additionally, some caregivers also reported sharing what they learned with friends and neighbors outside of the household. The messages that described sharing with others focused more so on nutrition and WASH than parenting practices for ECD.

Likewise, when further asked about impacts on the community more broadly, caregivers further reported positive impacts for other children and families. Caregivers commented that other children in the community seemed cleaner and were healthier than before. Again, caregivers generally described these community changes in terms of child nutrition and health. Some caregivers specifically attributed these changes among other families in the community as a result of adhering to the messages and advice received at the health facility.

Interviewer: Did you notice any change in your community relative to last year? Respondent: Yes, I can say there is something because I can see that the diseases have reduced here in this neighbourhood. There is a difference as well, some mothers know how to care for their child. Previously, I used to see dirty children without taking a bath, they used to give any food without care, but today this is not the case. Today you can meet a mother here in our area who does not have money but preparing porridge with peanuts and if you ask them whose it is for, they respond it is for the children. Even when they go to their gardens, they bring sweet potatoes for their children. (MOTHER-HOME-MS-4)

No reported changes

At the same time, a few other caregivers perceived no differences in their own caregiving knowledge, perceptions, or practices as a result of health facility or community services. For instance, one caregiver explained how she had already known and been practicing all the advice received from providers. However, this caregiver was only exposed to a single intervention component - counselling at the health facility. She mentioned no prior experience with any community actor, did not recall seeing videos at the health facility, hearing any radio messages at the health facility or in the community, and only observing posters related to corona virus transmission and prevention at the health facility (MOTHER-HOME-MS-4). It appeared that those who perceived no changes had minimal exposure to program components.

Section 4: COVID-19 influences on program implementation

Health facility providers, community-based providers, PATH program staff, and other stakeholders were asked to describe how the COVID-19 pandemic has broadly affected their work and specifically with respect to the implementation of the Nurturing Care pilot. All shared that at the start of the pandemic (i.e., May-May 2020) program activities both at health facilities and in the community were reduced and even temporarily halted. All noted that caregivers' visits to health facilities reduced substantially largely due to community members' fear of contracting the disease (CCD TECHNICIAN-MR-1), but also because some incorrectly believed health facilities were closed (HF DIRECTOR-MR-1) or that people were prohibited from visiting health facilities (ADEMO REPRESENTATIVE-1). As a result, health facility providers, community activists, community leaders, and PATH staff described organizing community sensitization campaigns to address this misinformation and encourage people to still visit health facilities. Respondents consistently shared that those community efforts were effective in addressing barriers and increasing health facility visits.

With regards to the health facility-based services, providers described a number of operational and structural changes at the facility as a result of COVID-19. For example, providers described how the number and frequency of consultation days (e.g., family planning, prenatal/postnatal, malnutrition consultation) were reduced.

> *For prenatal consultations, we used to have them on monthly basis. Currently we are having them once every three months, children with mental health issues we used to attend them every two weeks, but now we are doing it once per month. For serious malnutrition cases, we attended to them once per week but now we are having them every two weeks… there are those children who need our close monitoring and this is not happening, because of the pandemic, and the child will have delays, as a result of this situation. (MCH NURSE-MR-1)*

One key programmatic change to health facility-based services due to COVID-19 was the suspension of toy boxes that had been previously available for children to play with in the waiting areas. Health facility providers, health directors, and PATH program staff consistently highlighted how this was a major COVID-related adjustment to the original program, which they all perceived was a beneficial program component.

> *Before we used to have toys here but we would also counsel the caregivers to have them made from home using locally acquired material and that they should bring some to the health facility during consultations for their child use. They would bring dolls, shakers, and other toys that their children would use while waiting for their consultation or even during consultation…. Year 2020 has been very different because we had to suspend the use of toys due to the current pandemic. (CCS TECHNICIAN-MS-1)*

Health facility providers and directors reported increased cases of child malnutrition due to COVID-19. They attributed this in part due to the pandemic effects on household labor (i.e., agriculture) and reduced food access and increased prices.

> *The pandemic affected the whole economy of our community, markets were closed, very little was produced in the small farms, because people had movement restrictions. Were it not for the pandemic, we would have brilliant results from our work, a lot of effort was done last year aiming at reducing at-risk cases, but suddenly everything stopped. The children were the first*

to be affected by this situation. With caregivers, they were unable to leave their homes to go and look for food for their families. (APE REPRESENTATIVE)

Community-based providers reported similar program modifications due to the pandemic, but also described continued service delivery. COVida-AMASI providers reported reducing the duration of visits (COVida/AMASI--MS-1) or contacting families over the phone instead of in person (COVida/AMASI-MR-1, COVida/AMASI-MS-1).

Before [COVID], we used to pass via families' households for about one hour to talk to the family and to sensitize, however, since we are in this pandemic era, things have changed, it is normal to arrive there and follow up on issues that we have planned, we play with the children, we monitor and then we leave and we praise the family. Now it is 15 or 20 minutes. (COVida/AMASI-MS-1)

ADEMO providers reported convening group meetings less frequently and convening fewer number of people (ADEMO-CA-2). Likewise, APEs also reported reducing the number of people at community group educational talks (APE-CA-3), reducing the number of group educational talks per month (APE-MR-2), and shifting from educational talks in groups to home visits for individual families (APE-CA-2).

Before this time of this Corona virus, we used to convene people for meetings, we used to convene people for educational talks but due to this Corona virus, I am doing a lot of house visits, house to house. I provide educational talk there, I undertake home visits there as well, I counsel there. (APE-CA-2)

There were restrictions in places like churches, mosques and markets where the APEs used to perform their activities… We created small groups and we managed to recover the activists as time went by. (APE REPRESENTATIVE)

Community providers and PATH staff also mentioned how greater efforts were currently being made to broadcast messages via community radios, personal radios, as well as even the distribution of radios by PATH to activists.

Finally, PATH staff highlighted COVID-related challenges to conducting trainings, particularly at the early stage of the pandemic (March 2020), when some trainings had to be cancelled all together.

When COVID-19 was announced, we had to stop all the trainings, we had to think differently on how to undertake on-the-job training in the COVID context. Taking into consideration that here in Monapo, the internet issue, technological issue is a challenge, how to take on-the-job training with the providers in Carapira, in Monapo Rio where there is no electricity. Here in Monapo Sede, it is a little bit better, but how could we do for the other areas? These are some of the challenges that popped up that forced us to focus on what was possible for the providers. (PATH PROGRAM TEAM-1)

In March, we were completely paralyzed, that reduced our support to the community, there were trainings that never took place, because of the pandemic. (PATH PROGRAM TEAM-2)

In summary, COVID has caused some changes to the format and structure of service delivery at health facilities and communities, resulting in generally lower intensity of services. Nevertheless, health facility and community providers were able to successfully adapt much of the pre-pandemic services at both health facilities and the community, which are still ongoing and demonstrating feasibility even throughout the current pandemic.

DISCUSSION

We conducted a qualitative implementation evaluation to assess the delivery, acceptability, barriers and facilitators, and perceived changes associated with a multi-component collective action pilot to integrate nurturing care and promote ECD in Monapo district, in rural Mozambique. This two-year long pilot is unique in leveraging existing child health services at both the facility and community levels and engaging various actors and stakeholders. Namely, developmental monitoring and counseling on nurturing care was integrated into ongoing child health visits; information was broadcasted via media at the facility waiting rooms and across communities; and routine home visits by various community actors were enhanced to incorporate messages to promote ECD. As such, nurturing care services for ECD were delivered alongside services on health, nutrition, family planning and others. While intensive technical support was initially provided by PATH staff for the implementation of the pilot, this support transitioned to technical assistance of district and local supervisors for them to increasingly oversee and lead in the delivery of MCH and nutrition services that integrated ECD. Overall, this collective action, health systems strengthening model achieved uptake and ownership of ECD services by government and partners demonstrating potential for sustainability.

More specifically at the health systems levels, we found that this pilot successfully enhanced supervision structures, more efficient operations and streamlining of child services, increased referrals processes and identification of children at risk, and bolstered district collaborations to promote ECD. More broadly, stakeholders emphasized how the intervention further raised awareness for ECD across the district and even provincial levels and mobilized partners to prioritize and demand ECD services. The intervention improved buy-in, support, and partnerships with higher-level government health stakeholders at the district and provincial levels. Leveraging the existing resources, personnel, and systems was perceived as a novel aspect of this pilot.

Overall at the provider level, we found that the pilot increased health providers' knowledge and skills pertaining to nurturing care, as well as other skills such as interpersonal counseling more broadly. We found that it was feasible for facility- and community-based providers to deliver a range of nurturing care messages on nutrition, breastfeeding, child dietary diversity, maternal and child health, ECD milestones, stimulation practices, and father involvement as part of their existing roles and responsibilities. Providers, as well as other stakeholders, were appreciative of the training, mentorship, supervision, and program materials they received.

At the same time, we found noteworthy variability in the degree to which different providers promoted nurturing care messages, and specifically ECD messages. Generally, facility-based providers more consistently described promoting multiple aspects of nurturing care – MCH, nutrition, and developmental monitoring – than community-based providers. The less prominent degree to which community providers reported delivering ECD messages is consistent with the fact that there have been many more intensive community-based child health and nutrition interventions in Nampula supported by other partners since 2006. Child health and nutrition practices have been adopted into national provider trainings and monitoring tools and indicators for much longer and communities have been sensitized for many more years as to more easily

recall than developmental interventions, which were newly integrated and introduced for one of the first times as part of this pilot.

Further unpacking this delivery variation in ECD messages among the three community actors, it appeared that ADEMO activists most frequently mentioned integrating developmental monitoring and stimulation into their services. On the other hand, AMASI followed by APEs were the least likely to report developmental monitoring or promoting stimulation messages for ECD, but did consistently mention promoting nutrition messages. This variation in community actors' focus on ECD could possibly be explained by their diverse responsibilities, scopes of work, and expertise. For example, AMASI activists focus on supporting orphan and vulnerable children and families (targeted services), and ADEMO specifically focus on families of children with developmental delays and disabilities (indicated services). In contrast, APEs described more general responsibilities that encompassed various issues spanning nutrition, WASH, family planning, etc., and their responsibilities are more for the population at-large (universal services). Furthermore, it is worth noting that APEs in Monapo district have been trained and mobilized for other district health initiatives and priorities and experience human resource constraints for a large population catchment area (e.g., over 1000 families per APE, as compared to 10-30 families supported by activists). Additionally, prior formative research conducted internally by PATH revealed that both APE and APE supervisors' baseline skills were found to be very low, and the pilot had to invest in building their overall capacity alongside supporting the ECD interventions. These workforce constraints may have contributed to the varied implementation described across providers and the range in feasibility of delivering all intended nurturing care messages in a standardized manner (Yousafzai, Rasheed, Daelmans, et al., 2014).

In addition to the health system and provider levels, caregivers were also satisfied with the services received – including the nurturing and parenting messages and highlighting the positive interpersonal counselling received by providers at the health facility – and were reported as having increased knowledge and improved practices pertaining to multiple nurturing care messages. Stakeholders, providers, and caregivers alike consistently described intervention benefits with respect to increasing caregiver participation in child health services, caregiver awareness of ECD, and nurturing care behaviors. Specifically, respondents consistently perceived greater improvements in caregiver knowledge about the importance of nutrition and ways to improve child dietary diversity (e.g., enriched porridges) and discussed child nutrition relatively more frequently than ECD messages. Nevertheless, respondents still highlighted how caregivers gained new knowledge and skills pertaining to ECD topics including developmental milestones, stimulation practices, making homemade toys, and speaking to the baby while in the womb. In particular, caregivers remembered and enjoyed messages about homemade toys and noted the novelty of this new topic. Providers emphasized how caregivers could feasibly implement this without financial inputs. Many caregivers also specifically mentioned how talking to the baby while in the womb was another new message that they had not previously heard about prior to the pilot. Upon the review of findings, the PATH field team contextualized how social and cultural norms regarding the uncertainties of the pregnancy period and childbirth outcomes caused some parents to have some reluctance and even resistance to prenatal caregiving such as communicating to the child before birth. Finally, a handful of respondents also described greater father involvement in childcare and play activities with the child. Overall, results suggest that this program delivery model – and specifically integrating brief ECD messages into universal child health services as

part of routine well-child and sick-child contacts – is feasible for relaying information and signals of behavior change with regards nurturing care messages. In particular, the fact that roughly half of the randomly selected caregivers attending such low intensity universal services were able to recall ECD messages and share how they enacted improved parenting practices home indicates promise for promoting early learning and ECD through existing universal health facility services and with adequate technical support.

We identified several key barriers and facilitators of the pilot implementation. All respondents highlighted lack of resources (e.g., financial, material, structural) as a cross-cutting barrier constraining the health system such as workforce retention and remuneration, providers' capacities/motivation to carry out job responsibilities, and caregiver behavior change. Several caregivers and providers mentioned language barriers affecting fluency of communication between some health facility providers and caregivers, considering how some health providers were posted in Monapo and only spoke Portuguese and not the local language. Some caregivers also noted language and literacy barriers that prevented them from understanding some of the messages broadcasted on the radio and tv and text on some of the posters. However, all nurturing care media and print messages introduced in the pilot were produced in the local language (Makua), and it appeared caregivers were referring to content from other ongoing campaigns at the health facility (i.e., not about nurturing care for ECD, such as national COVID awareness). System-level barriers were also mentioned, ranging from far distances between households and the health facility, limited health facility and community providers, high staff turnover, and challenges in coordination between facility- and community-based providers. With respect to facilitating factors, caregivers found the consistency and reinforcement of messages across multiple providers as beneficial and appreciated messages which did not require financial resources to implement (e.g., making toys from household objects). Providers agreed that the training, supervision, and materials they received prepared them for the job, although some highlighted that further support was needed. Stakeholders highlighted the district government's strong leadership and commitment as a key facilitator.

It is important to recognize that the pilot implementation began in 2018 but then was interrupted by the COVID pandemic with a temporary pause in all field activities supported by PATH and considerable impacts on health system operations and caregiver utilization of child health services. This research was conducted several months following program resumption and modifications for COVID-19 risk mitigation. Several changes were required to the format and structure of service delivery at health facilities and communities, including supervision and technical assistance, which generally resulted in lower intensity of services than originally intended. Nevertheless, we found that health facility and community providers were able to successfully adapt much of the pre-pandemic services at both health facilities and the community and continue implementation with fidelity. Our results reflect conditions still during the pandemic (October-November 2020), but highlight feasibility, acceptability, and promising trends of changes in the health system, among providers, caregivers, and young children despite the COVID-19 pandemic context.

Overall, our study extends the growing body of evidence on nurturing care interventions, and specifically those that have integrated parenting and nutrition within existing health systems. Prior studies have shown the feasibility of integrating early childhood services into primary care or community health platforms, and the effectiveness of such programs for improving ECD and

caregiving outcomes across diverse contexts. However, the majority of prior programs have focused specifically on delivery through a single cadre or context for promoting nurturing care: either exclusively at health facilities (Chang et al., 2015; Hamadani et al., 2019) or entirely in the community (Galasso et al., 2019; Yousafzai, Rasheed, Rizvi, et al., 2014). In contrast, this pilot is one of the first to utilize existing structures across both health facility and community platforms and coordinate across multiple providers/actors within the district health sector through a collective action model to deliver a concerted package of nurturing care services (i.e., universal, indicated, and targeted services) for all young children in the Monapo district, Mozambique. Integrating nurturing care services into multiple existing health facility- and community-based services spanning the pyramid of services may be more effective for increasing coverage, facilitating sustainability, and reducing inequities in caregiving and ECD at a population level.

Based on our findings, we offer several considerations for enhancing future programming. First, in terms of facility-based intervention components, counselling sessions with providers appeared more effective for promoting nurturing care information than the media and posters. Our observations of health facilities triangulated varying levels of implementation of the media and posters across the three facilities. Less than half of caregivers recalled hearing radio or video messages about nutrition or parenting during their recent visit to the health facility. This could be due to several logistical constraints or implementation issues that we identified, relating to the broadcast schedule and timing and placement of TVs and radios at the health facilities. We also identified broader challenges affecting implementation such as electricity cuts as well as language barriers that prevented some caregivers from fully understanding media messages or the explanation of posters by providers, who were not all equally proficient in the local language. Standardized implementation protocols for the media sources and posters (e.g., a more frequent schedule than 2-3 times/week or exclusively at the start of the morning; more regular provider facilitation; optimized placement and sufficiently audible sound as feasible in the health facility) may help improve uptake and maximize potential benefits. For example, considering new COVID-19 risk mitigation protocols and the greater use of outdoor waiting areas, placement of posters and radios should be explored as much as possible to optimize exposure in these new spaces where patients spend the majority of their time. Additionally, our findings indicate that modifications such as ensuring that all audio media materials are in local languages (including other health messages promoted as part of national government campaigns) and developing more demonstration-based videos targeting specific practices may be equally important. Moreover, bolstering and strengthening linkages between program components such as media-based messages, provider counseling, and incorporating materials (e.g., toys for the child) has potential to further improve parenting behavioral changes (Aboud & Yousafzai, 2015). For example, in a prior study in three Caribbean countries by Chang et al. (2015), relatively short video clips were displayed in the waiting areas of well-baby consultations to highlight concrete stimulation activities that parents could engage with their child(ren) to motivate behavior change. Following the videos, nurses facilitated a large group discussion with those caregivers in the waiting area to demonstrate, further explain, and facilitate discussion of these parenting behaviors. Similarly, integrating counseling alongside the use of media – whether that is explicitly directing participants to the media sources or following up with a brief discussion – may increase exposure and enhance complementarity to reinforce key messages. It is worth noting that the pilot Initiative model pre-COVID-19 had incorporated playbox sessions in the health facility waiting rooms, where providers counseled caregivers on the importance of age-appropriate play and guided caregivers and children

on how to use selected play materials in the playbox and make toys for the child at home. This strategy had been previously piloted in 2014-2015 in Maputo Province and was qualitatively shown to be feasible, acceptable, and positively influence caregiver knowledge and practices for ECD (Karuskina-Drivdale, Kawakyu, & Mulhanga, 2016). Although this program component had to be discontinued for COVID-19 risk mitigation, this interactive component may offer promise in the next phase of the program model and if there is low risk of COVID-19 in the local context.

Second, health systems resource constraints were highlighted as key barriers to the program. Specifically, limited staff, high staff turnover, varying health facility provider motivation levels, inadequate salaries, and large geographical catchment areas (particularly for community-based providers) were mentioned by various respondents. Future interventions should not only leverage existing inputs, but also seek ways to increase investment into and the availability of such inputs to ultimately ensure intervention sustainability and scale-up. Prior studies have addressed similar challenges of limited delivery agents by bringing multiple providers to work together in one setting (e.g., APEs/volunteers to assist providers at the clinic) (Chang et al., 2015; Hamadani et al., 2019) or training volunteer mothers as peer leaders to conduct home visits in the community (Attanasio et al., 2014). PATH has already started working with lay staff such as HIV counselors[6] in the roll out playbox sessions prior to COVID-19 and on the radio sessions later on. Further mobilizing and training lay workers that are parallel to MOH system can be an effective interim strategy for promoting nurturing care while the government builds capacity and trains sufficient human resources for health care, if both government and donors agree to this. In addition, provider incentives can be introduced to help increase motivation and reduce turnover. These however need to consider experiences of previous projects in performance-based financing, as not all have been conducive to systems strengthening, and as aligned with the government's strategy.

Third, our results revealed opportunities for enhancing the ECD content. All facility- and community-based providers primarily described program content on ECD as focused on developmental monitoring, preventing delays among children at-risk, and toy making; and caregivers recalled ECD messages less frequently relative to nutrition and health messages. The fact that investment in nutritional interventions in Nampula goes back to 2006 and is firmly a part of provider tools, which ECD interventions were introduced 2 years prior to the study and are not yet firmly integrated in the relevant tools, can explain some of the discrepancies in frequency of nutritional versus ECD activities. Food insecurity and drought is also a deep-rooted issue in Nampula, which may also contribute to the particular focus on nutrition.

Furthermore, as referred to earlier, ECD was described from a medical model of preventing risks and monitoring for potential developmental delays and not equally as strong from a promotion-based perspective encouraging parent engagement in basic learning activities that is appropriate and has great potential as a universal strategy for improving ECD. More specifically, promotion of age-appropriate stimulation activities (i.e., play, learning, communication) and support for enriched parent-child interactions were less frequently discussed by caregivers but also providers. This can be partially explained by MoH focus to improve reporting on developmental delays, which are new indicators recently added at healthy and sick child consultations, and the lack of

[6] This has been through collaboration with ICAP, an international NGO that provides technical assistance to the Ministry of Health to support the decentralization of HIV services (e.g., prevention of mother-to-child transmission of HIV; HIV care and treatment for adults and children; integrated TB/HIV care) in Nampula Province

additional indicators pertaining to early learning, responsive care, or other basic ECD milestones. Recent findings from a global meta-analysis of 102 parenting interventions – spanning various contexts (i.e., high-, middle-, and low-income countries) and platforms (e.g., home visiting, peer groups, health facilities) – found that parenting programs that particularly address content on responsive caregiving (i.e., highlighting positive caregiver-child interactions and building caregiver skills to appropriately identify and respond to children's cues) achieve greater effect sizes for improving ECD and parenting outcomes than those programs that do not include program components targeted responsive caregiving (Jeong et al., 2021). Indeed, the vast majority of programs delivering components for responsive caregiving in LMICs used either home visiting or peer group based platforms. Only a few used health platforms to promote responsive caregiving in a LMIC context, such as the intervention by Chang et al. (2015) that was delivered entirely as part of well-baby visits at primary health care centers across three Caribbean countries and had a stronger counseling and behavior change focus.

Utilizing multiple behavior change techniques across service platforms – beyond information sharing, counseling, and media alone – by incorporating interactive activities/role plays, demonstrations, problem solving, peer learning and support is crucial for enhancing responsive care and improving ECD outcomes (Aboud & Yousafzai, 2015). Indeed, information sharing alone or low-dose exposure to new concepts may be insufficient for enacting meaningful and longer-term behavior change. Alternative behavior change techniques through the use of peer group-based models are increasingly popular as they offer advantages in fostering peer/social learning, discussions, and social support. While group-based education talks were delivered both at the health facility and in the community prior to the COVID-19 pandemic, they were largely eliminated or reduced at the time of this study to comply with COVID-19 risk mitigation measures. The home visiting model currently delivered by APEs in the study context are somewhat irregular largely due to human resource constraints and thus insufficient for building upon and layering continued messages with households over time to reinforce ECD. Future interventions should evaluate the feasibility of promoting regular peer group sessions both in the community and at health facilities, considering that currently most group sessions are one-off educational talks and do not offer regularity or intensity needed to effect behavior change. Partnerships with HIV partners supporting regular caregiver group sessions or even looking beyond health to group platforms such as adult literacy classes and agricultural groups targeting families can be viable strategies. Prior trials have shown that health workers can feasibly deliver group counseling sessions with parents at health facilities (Chang et al., 2015; Hamadani et al., 2019) and facilitate community group meetings (Yousafzai, Rasheed, Rizvi, et al., 2014), which are effective program models for improving caregiving and ECD outcomes. In fact, emerging literature that has shown that peer group-based models have greater reach, cost-effectiveness, and economies of scale for delivering nurturing care programs than individualized models (e.g., home visiting) (Grantham-McGregor et al., 2020; Luoto et al., 2021).

We recognize that some of these recommendations will require additional inputs, innovations, and even redesigns to the health system, in a manner that is above and beyond what may be status quo or has been previously attempted by the health system in the local context. However, it is at least worth considering that existing health systems have not been traditionally designed and nurturing care service delivery has not been adequately evaluated to know whether the current system/state can achieve the levels of meaningful change in parenting practices and ECD outcomes and in a

consistent manner to promote ECD from a continuity of care and a developmental lifecourse perspective. As such, it is important to acknowledge that health systems may potentially require greater inputs relating to training, remuneration, and strengthening and coordination with alternative platforms (i.e., community platforms) to ideally and meaningfully enhance ECD in the long-term through universal, indicated, or even targeted services. Importantly, we found that providers and parents in Monapo consistently enjoyed, valued, and desired greater information about parenting, and particularly ECD services in the community. Therefore, further understanding and even infusing greater demand for ECD services among parents (as the end-users) is another aspect that should be leveraged to advocated for and propel new investments in systems-level transformations for promoting ECD.

Fourth, we identified gaps and challenges regarding follow-up and continuity of child health care once children and families left the health clinic and returned to the community. While there was evidence of increased case referrals identified in the community to health facilities, similar efforts to enhance linkages from health facilities back to communities were lacking. Health facility and community providers agreed that this was a particular concern. Currently, there are no MoH tools or processes to document or follow up on such referrals, which will be needed in order to facilitate the monitoring of this type of continuity of care. Strengthening communication channels, information systems, and follow up care and case management between health facility and community systems may be enhance the potential for improving nurturing care and ECD.

Limitations

Several limitations to this study are worth highlighting. First, our qualitative study relied on self-report and is subject to social desirability bias, whereby respondents may have provided information in a way they thought would be appealing to interviewers and not reflecting their true beliefs or experiences. Although we report respondents' *perceived* changes, we are not able to quantify program effects or attribute causality to any of the reported changes at the health system, provider, or caregiver levels. Therefore, all findings regarding the perceived changes should be interpreted with caution. Second, we recruited caregivers among those who had visited the health center in the past month, which may limit the generalizability of our results to caregivers who had not visited the health facility recently (i.e., those who do not choose to seek care at health facilities or who face the greatest challenges in accessing care at health facilities). Additionally, while all caregivers had visited and received services at the health facility, we did not also purposefully select caregivers who had interacted with community actors (e.g., home visits from APE, ADEMO, AMASI). Therefore, we are unable to adequately evaluate caregivers' experiences with and the implementation of community-based services, and in particular those caregivers who may have received targeted or indicated support for nurturing care from AMASI and ADEMO, respectively (all tiers of the service pyramid). Third, this study occurred during the COVID-19 pandemic and data were collected several months after a temporary pause to intervention components and program modification to mitigate COVID-19 risk transmission. While results generally showed that the pilot was resilient and demonstrated feasibility in light of the COVID-19 pandemics, results may be limited to this particular period in time and not generalizable. Finally, given that the intervention was embedded within existing health services and encompassed the reinforcement of existing services and introduction of new services, it was challenging for both

caregivers and providers to disentangle individual intervention components, specifically those supported by this pilot nurturing care initiative.

In light of these limitations, our results provide preliminary evidence suggesting several potential program improvements that should be implemented and subsequently further evaluated by conducting a robust quantitative impact and implementation evaluation to estimate intervention fidelity, quality, and effects on health system, caregiving, and child outcomes. Such quantitative implementation research is needed to provide causal evidence on whether this pilot model of integrating nurturing care interventions into existing facility and community services can achieve its intended impacts both in terms of systems readiness and on nurturing care and child development outcomes, something our current study design cannot quantify. Given the multi-component and multi-context nature of this intervention, a complex study design will be required to disentangle the individual impacts of unique intervention components (e.g., the individual contribution of the pilot initiative components versus existing services; the effect of health facility services relative to community services). To fully evaluate all dimensions of this multifaceted pilot initiative spanning the implementation and impacts of the universal, indicated, and targeted services as well as outcomes across the health system-, provider-, caregiver-, and child-levels, it will be critical to adequate power and ensure a sufficient sample size from the outset.

CONCLUSION

Our results support the feasibility, acceptability, and perceived benefits of integrating nurturing care within existing health facility and community-based services. We identified key facilitators, namely provider training, supervision, and materials. However, we also identified key challenges related to content, implementation, workforce/health system, and contexts that should be addressed to strengthen implementation of the pilot initiative and increase especially caregivers' knowledge and practices regarding early learning and responsive care in particular. A major innovation and strength of the pilot collective action model is that it leverages the existing systems in the district that are supported by the government or other partners at the present moment as a means of facilitating greater potential for sustainability and scale. As a result, the strategy may limit feasibility of exploring all possible recommendations and range of potential programming options in the study context, which will largely depend on government readiness and/or donor support to invest in the implementation and testing of adapted/new invention strategies. Following the promising trends from this qualitative evaluation, and once needed improvements to delivery models are set in place, a rigorous quantitative implementation and impact evaluation should be conducted to assess the extent to which the pilot is being implemented as designed and the population is receiving the intended dose of services; and to determine the range of effects attributable to this collective action model for nurturing care on health system, caregiver, and child outcomes. Additionally, a costing analysis can be valuable for decision-making and guiding any future next steps. Taken together, these additional and complementary types of external evaluations should be coupled alongside continuing program implementation to provide a further evidence about the extent to this intervention model can be taken-up and implemented by the government, with quality, impact, potential for sustainably, and at scale. Ultimately, large-scale, government-led, high-quality ECD systems are needed to reduce inequities in nurturing care and ECD and ensure that all children at a population-level can reach their developmental potential.

REFERENCES

Aboud, F. E., & Yousafzai, A. K. (2015). Global health and development in early childhood. *Annu Rev Psychol, 66*, 433-457. doi:10.1146/annurev-psych-010814-015128

Attanasio, O. P., Fernandez, C., Fitzsimons, E. O., Grantham-McGregor, S. M., Meghir, C., & Rubio-Codina, M. (2014). Using the infrastructure of a conditional cash transfer program to deliver a scalable integrated early child development program in Colombia: cluster randomized controlled trial. *BMJ, 349*, g5785. doi:10.1136/bmj.g5785

Black, M. M., Walker, S. P., Fernald, L. C. H., Andersen, C. T., DiGirolamo, A. M., Lu, C., . . . Lancet Early Childhood Development Series Steering, C. (2017). Early childhood development coming of age: science through the life course. *Lancet, 389*(10064), 77-90. doi:10.1016/S0140-6736(16)31389-7

Britto, P. R., Lye, S. J., Proulx, K., Yousafzai, A. K., Matthews, S. G., Vaivada, T., . . . Bhutta, Z. A. (2017). Nurturing care: Promoting early childhood development. *Lancet, 389*(10064), 91-102. doi:10.1016/S0140-6736(16)31390-3

Britto, P. R., Singh, M., Dua, T., Kaur, R., & Yousafzai, A. K. (2018). What implementation evidence matters: scaling-up nurturing interventions that promote early childhood development. *Ann N Y Acad Sci, 1419*(1), 5-16. doi:10.1111/nyas.13720

Chang, S. M., Grantham-McGregor, S. M., Powell, C. A., Vera-Hernandez, M., Lopez-Boo, F., Baker-Henningham, H., & Walker, S. P. (2015). Integrating a Parenting Intervention With Routine Primary Health Care: A Cluster Randomized Trial. *Pediatrics, 136*(2), 272-280. doi:10.1542/peds.2015-0119

Engle, P. L., Fernald, L. C., Alderman, H., Behrman, J., O'Gara, C., Yousafzai, A., . . . Global Child Development Steering, G. (2011). Strategies for reducing inequalities and improving developmental outcomes for young children in low-income and middle-income countries. *Lancet, 378*(9799), 1339-1353. doi:10.1016/S0140-6736(11)60889-1

Galasso, E., Weber, A. M., Stewart, C. P., Ratsifandrihamanana, L., & Fernald, L. C. H. (2019). Effects of nutritional supplementation and home visiting on growth and development in young children in Madagascar: a cluster-randomised controlled trial. *Lancet Glob Health, 7*(9), e1257-e1268. doi:10.1016/S2214-109X(19)30317-1

Gertler, P., Heckman, J., Pinto, R., Zanolini, A., Vermeersch, C., Walker, S., . . . Grantham-McGregor, S. (2014). Labor market returns to an early childhood stimulation intervention in Jamaica. *Science, 344*(6187), 998-1001. doi:10.1126/science.1251178

Gilmore, B., & McAuliffe, E. (2013). Effectiveness of community health workers delivering preventive interventions for maternal and child health in low- and middle-income countries: a systematic review. *BMC Public Health, 13*(1), 847. doi:10.1186/1471-2458-13-847

Gladstone, M. J., Chandna, J., Kandawasvika, G., Ntozini, R., Majo, F. D., Tavengwa, N. V., . . . Team, S. T. (2019). Independent and combined effects of improved water, sanitation, and hygiene (WASH) and improved complementary feeding on early neurodevelopment among children born to HIV-negative mothers in rural Zimbabwe: Substudy of a cluster-randomized trial. *PLoS Med, 16*(3), e1002766. doi:10.1371/journal.pmed.1002766

Grantham-McGregor, S., Adya, A., Attanasio, O., Augsburg, B., Behrman, J., Caeyers, B., . . . Vats, K. (2020). Group Sessions or Home Visits for Early Childhood Development in India: A Cluster RCT. *Pediatrics, 146*(6). doi:10.1542/peds.2020-002725

Hamadani, J. D., Mehrin, S. F., Tofail, F., Hasan, M. I., Huda, S. N., Baker-Henningham, H., . . . Grantham-McGregor, S. (2019). Integrating an early childhood development programme into Bangladeshi primary health-care services: an open-label, cluster-randomised controlled trial. *Lancet Glob Health, 7*(3), e366-e375. doi:10.1016/S2214-109X(18)30535-7

Jeong, J., Franchett, E. E., Ramos de Oliveira, C. V., Rehmani, K., & Yousafzai, A. K. (2021). Parenting interventions to promote early child development in the first three years of life: A global systematic review and meta-analysis. *PLoS Medicine, 18*(5), e1003602. doi:10.1371/journal.pmed.1003602

Karuskina-Drivdale, S., Kawakyu, N., & Mulhanga, F. l. (2016). A playbox intervention in health facility waiting rooms in Mozambique: Improving caregivers' knowledge, skills and communication with health professionals. *International Journal of Birth and Parent Education, 6*(3), 29-32.

Lassi, Z. S., Das, J. K., Zahid, G., Imdad, A., & Bhutta, Z. A. (2013). Impact of education and provision of complementary feeding on growth and morbidity in children less than 2 years of age in developing countries: a systematic review. *BMC Public Health, 13*(3), S13. doi:10.1186/1471-2458-13-S3-S13

Lu, C., Black, M. M., & Richter, L. M. (2016). Risk of poor development in young children in low-income and middle-income countries: an estimation and analysis at the global, regional, and country level. *Lancet Glob Health, 4*(12), e916-e922. doi:10.1016/S2214-109X(16)30266-2

Luoto, J. E., Lopez Garcia, I., Aboud, F. E., Singla, D. R., Fernald, L. C. H., Pitchik, H. O., . . . Alu, E. (2021). Group-based parenting interventions to promote child development in rural Kenya: a multi-arm, cluster-randomised community effectiveness trial. *Lancet Glob Health, 9*(3), e309-e319. doi:10.1016/S2214-109X(20)30469-1

McCoy, D. C., Peet, E. D., Ezzati, M., Danaei, G., Black, M. M., Sudfeld, C. R., . . . Fink, G. (2016). Early childhood developmental status in low- and middle-income countries: National, regional, and global prevalence estimates Using predictive modeling. *PLoS Medicine, 13*(6), e1002034. doi:10.1371/journal.pmed.1002034

Milner, K. M., Bernal Salazar, R., Bhopal, S., Brentani, A., Britto, P. R., Dua, T., . . . Lawn, J. E. (2019). Contextual design choices and partnerships for scaling early child development programmes. *Arch Dis Child, 104*(Suppl 1), S3-S12. doi:10.1136/archdischild-2018-315433

Ministerio da Saude, Instituto Nacional de Estatística, & ICF International. (2011). *Moçambique Inquérito Demográfico e de Saúde*. Calverton, Maryland, USA: Instituto Nacional de Estatística.

Prado, E. L., Larson, L. M., Cox, K., Bettencourt, K., Kubes, J. N., & Shankar, A. H. (2019). Do effects of early life interventions on linear growth correspond to effects on neurobehavioural development? A systematic review and meta-analysis. *Lancet Glob Health, 7*(10), e1398-e1413. doi:10.1016/S2214-109X(19)30361-4

Richter, L. M., Daelmans, B., Lombardi, J., Heymann, J., Boo, F. L., Behrman, J. R., . . . the Lancet Early Childhood Development Series Steering, C. (2017). Investing in the foundation of sustainable development: pathways to scale up for early childhood development. *Lancet, 389*(10064), 103-118. doi:10.1016/S0140-6736(16)31698-1

Schreier, M. (2014). Qualitative Content Analysis. In U. Flick (Ed.), *The SAGE Handbook of Qualitative Data Analysis* (pp. 170-183). London: SAGE Publications.

Taneja, S., Sinha, B., Upadhyay, R. P., Mazumder, S., Sommerfelt, H., Martines, J., . . . ci, K. M. C. d. s. g. (2020). Community initiated kangaroo mother care and early child development in low birth weight infants in India-a randomized controlled trial. *BMC Pediatr, 20*(1), 150. doi:10.1186/s12887-020-02046-4

Walker, S. P., Chang, S. M., Vera-Hernandez, M., & Grantham-McGregor, S. (2011). Early childhood stimulation benefits adult competence and reduces violent behavior. *Pediatrics, 127*(5), 849-857. doi:10.1542/peds.2010-2231

World Health Organization. (2019). Operationalizing nurturing care for early childhood development: the role of the health sector alongside other sectors and actors.

World Health Organization, United Nations Children's Fund, & World Bank Group. (2018). Nurturing care for early childhood development: a framework for helping children survive and thrive to transform health and human potential.

Yousafzai, A. K., Rasheed, M. A., Daelmans, B., Manji, S., Arnold, C., Lingam, R., . . . Lucas, J. E. (2014). Capacity building in the health sector to improve care for child nutrition and development. *Ann N Y Acad Sci, 1308*, 172-182. doi:10.1111/nyas.12322

Yousafzai, A. K., Rasheed, M. A., Rizvi, A., Armstrong, R., & Bhutta, Z. A. (2014). Effect of integrated responsive stimulation and nutrition interventions in the Lady Health Worker programme in Pakistan on child development, growth, and health outcomes: a cluster-randomised factorial effectiveness trial. *Lancet, 384*(9950), 1282-1293. doi:10.1016/S0140-6736(14)60455-4