

# Assessment of the use of PATH's early childhood development monitoring and counseling materials in Maputo Province, Mozambique

Private-Public Partnership for Early Childhood  
Development – Mozambique





**Mailing Address**

PO Box 900922  
Seattle, WA 98109 USA

**Street Address**

2201 Westlake Avenue  
Suite 200  
Seattle, WA 98121 USA

[www.path.org](http://www.path.org)

© 2019 PATH. All rights reserved.

---

# Contents

<b>ACKNOWLEDGMENTS</b> .....	<b>V</b>
<b>ABBREVIATIONS</b> .....	<b>VI</b>
<b>EXECUTIVE SUMMARY</b> .....	<b>VII</b>
<b>INTRODUCTION</b> .....	<b>1</b>
Context .....	1
<b>EVALUATION AIM AND OBJECTIVES</b> .....	<b>8</b>
Study aim .....	8
Specific objectives .....	8
Secondary objective .....	8
The study site .....	9
Methods.....	9
Sampling and sample size .....	9
Training of field team and pilot.....	10
Data collection.....	10
Data management and analysis .....	11
<b>STUDY LIMITATIONS</b> .....	<b>12</b>
<b>STUDY RESULTS</b> .....	<b>13</b>
General characteristics of study participants.....	13
Objective 1: Document trends in ECD monitoring and referral to specialists since the integration of PATH's ECD monitoring and counseling materials in 2015 in Maputo Province. ....	16

<b>Objective 2: Assess the performance of facility-based HWs as it relates to following the monitoring and counseling approach outlined in the PATH HW flipchart and HW use of PATH’s monitoring and stimulation posters; and identify factors that influence HW performance. ....</b>	<b>20</b>
<b>Objective 3: Assess the usability of PATH’s monitoring and counseling posters among facility-based HWs, and factors that influence their use.....</b>	<b>35</b>
<b>Objective 4: Assess the performance of facility-based HWs as it relates to following the updated MOH IMCI job aid (as it pertains to the ECD section); and identify factors that influence HW performance. ....</b>	<b>39</b>
<b>Objective 5 [secondary objective]: Assess caregivers’ ability to recall key ECD messages and their intention to act after being exposed to ECD counseling in a HF. ....</b>	<b>41</b>
<b>DISCUSSION .....</b>	<b>50</b>
<b>Objective 1: Document trends in ECD monitoring and referral to specialists since the integration of PATH’s ECD monitoring and counseling materials in 2015 in Maputo Province. ....</b>	<b>50</b>
<b>Objective 2: Assess the performance of facility-based HWs as it relates to following the monitoring and counseling approach outlined in the PATH HW flipchart and HW use of PATH’s monitoring and stimulation posters; and identify factors that influence HW performance. ....</b>	<b>51</b>
<b>Objective 3: Assess the usability of PATH’s monitoring and counseling posters among facility-based HWs, and factors that influence their use.....</b>	<b>52</b>
<b>Objective 4: Assess the performance of facility-based HWs as it relates to following the updated MOH IMCI job aid (as it pertains to the ECD section); and identify factors that influence HW performance. ....</b>	<b>52</b>
<b>Objective 5 [secondary objective]: Assess caregivers’ ability to recall key ECD messages and their intention to act after being exposed to ECD counseling in a HF. ....</b>	<b>53</b>
<b>CONCLUSION AND RECOMMENDATIONS .....</b>	<b>54</b>
<b>REFERENCES.....</b>	<b>56</b>

---

## Acknowledgments

We gratefully acknowledge the US Agency for International Development in Mozambique and the Conrad N. Hilton Foundation for their funding and support of the study.

We thank district and provincial health authorities for their support in conducting this study, and mothers and health workers for participating in the interviews.

Many thanks to the LAC A Molecular field work team for their assistance in data collection and processing.

The contributions of the following individuals were invaluable for the study's success:

### **Co-Principal Investigators**

Manjari Quintanar Solares, Program Officer, PATH

Stergio Stakteas, Director, LAC A Molecular

### **Co-Investigators**

Judite Pinto, Monitoring and Evaluation Officer for PATH in Mozambique

### **Report reviewers**

Matthew Frey, Director, Global Integrated ECD/Nurturing Care Program, PATH

Melanie Picolo, MNCHN Program Manager and Senior Nutrition Advisor for PATH in Mozambique

Svetlana Drivdal, Regional ECD Advisor, PATH

This study was a collaborative effort between PATH and LAC A Molecular. The PATH team led the development of the protocol and tools, selected the study sites, assisted with data processing and data analysis, and developed this final report. The LAC A Molecular team provided input into the protocol and tools, led training of data collection assistants, carried out data collection and data processing, carried out initial data analyses, and developed the first draft of this report.

Photos: PATH.

---

## Abbreviations

ANC	antenatal care
ART	antiretroviral therapy
CCD	sick child consultation ( <i>consulta da criança doente</i> )
CCR	child at risk consultation ( <i>consulta da criança em risco</i> )
CCS	well child consultation ( <i>consulta da criança sadia</i> )
CHW	community health worker
CPP	postpartum consultation
CS	Centro de Saúde
ECD	early childhood development
HC	health center
HF	health facility
HIV	human immunodeficiency virus
HW	health worker
IEC	information, education, and communication
IR	intermediate result
IMCI	Integrated Management of Childhood Illness
MCH	maternal and child health
MNCHN	maternal, newborn, and child health and nutrition
MOH	Ministry of Health
MUAC	mid-upper arm circumference
OVC	orphans and vulnerable children
SD	standard deviation
TARV	antiretroviral therapy
UNICEF	United Nations Children’s Fund
USAID	US Agency for International Development
WHO	World Health Organization

---

## Executive summary

Approximately 250 million children younger than 5 years in low- and middle-income countries are at risk of not reaching their developmental potential. More than 66% of these children live in sub-Saharan African countries and are exposed to multiple risks, including poverty, malnutrition, poor health, and home environments with few learning opportunities. These factors adversely affect their cognitive, physical, and socio-emotional development. One key global recommendation is the need for routine maternal and child health and nutrition services to expand their scope to integrate early childhood development (ECD) content.

Since 2016, the US Agency for International Development in Mozambique has partnered with the Conrad N. Hilton Foundation and PATH in an innovative public-private partnership to support the government of Mozambique to systematically scale up the provision of child development monitoring and counseling services through facility- and community-based health services in Maputo Province. The approach of this partnership has been focused on ongoing capacity-building of service providers and their supervisors in specific health system touch points that reach children ages 0 to 3 years and their caregivers through training, mentoring, and supportive supervision. An intensive approach that consisted of monthly mentoring visits and graduation to quarterly supervision visits once a threshold score of quality standards was met by 75% of eligible providers in a given health facility (HF) was implemented in 18 high-volume, and therefore high-priority health facilities; and a less intensive approach that consisted of quarterly supervision visits was implemented in 31 lower-priority health facilities in six districts of Maputo Province. Under the partnership, PATH developed job aids and communication materials for specific touch points or audiences to assist in the integration of developmental monitoring and stimulation activities into routine maternal and child health service provision.

The aim of this study was to assess if the integration of ECD monitoring and counseling job aids and communication materials developed and distributed through the project into facility-based settings in Maputo Province led to increased early detection and referral of developmental delays, and to identify the factors that influenced the outcome. Specifically, this study aimed to document trends in ECD monitoring and referrals to specialists, assess the performance of facility-based health workers (HWs) in delivering the intervention, assess the usability of the job aids and communication materials, and assess caregiver recall of key ECD messages. The study used quantitative methods to collect and analyze consultation and referral data from 49 HFs, and qualitative methods to collect and analyze data from the 18 high-priority HFs where the more intensive ECD integration support approach had been implemented in six of the eight districts of Maputo Province. Data collection took place from September to November 2018 through review of HF registers (n = 49 HFs), observation of HWs providing consultations (n = 37 HWs, 63 observations), in-depth interviews with HWs (n = 37), a self-administered questionnaire for HWs (n = 37), in-depth interviews with physiotherapists (n = 4), and interviews with caregivers (n = 237).

During the period under evaluation, 590,660 children 0 to 3 years were monitored for developmental milestones in the study sites, and 2,157 were identified with a suspected developmental delay. Analysis of trend points suggests a positive trend: an increased number of children were reported to have been monitored for delays and received by specialists, such as physiotherapists, from May 2016 (when the partnership intervention initiated) to December 2018 (when the intervention had been consolidated in the target HFs). In all, 87% of HWs interviewed reported they felt they had identified more children with developmental delays since the ECD materials had become available. Physiotherapists interviewed reported that the project contributed to an increase in referrals, as it improved HWs' knowledge of the

importance of early referral of children identified with developmental delays. It is important to note that these results may have been influenced by the fact that in two districts in which the study was conducted, physiotherapy services had become available for the first time through project-supported outreach services, thereby leading to an increase in referrals in those districts and in Maputo Province in general.

Despite this positive trend, overall only 0.4% of children whose development was monitored were identified with a suspected delay within the period under evaluation, which is lower than would be expected based on prevalence of disabilities in the country (0.8% in children aged 0 to 4, according to the 2017 census) and the prevalence of acute malnutrition in Maputo Province (2.1% according to the 2011 Mozambique Demographic and Health Survey), which is commonly used as a proxy indicator for developmental delays. These results could suggest that the intervention may not be taking place consistently enough for all potential cases of developmental delays to be identified early, but they may also be reflective of the limitations of the tool used by providers to monitor child development (i.e., a poster showing developmental milestones according to age, developed and distributed under the project). While milestones-based monitoring is easy to roll out at scale in low-resource settings, such as Mozambique, it is not as sensitive a developmental monitoring tool as developmental assessment, which requires the use of a standardized and validated tool that allows assessment of individual development against development standards.

Analysis of HF registers and direct observation of consultations showed that providers conducted systematic developmental milestone monitoring in more than 70% of the contact points with children 0 to 3 years of age. However, only about 30% of HWs interviewed stated that they were able to conduct developmental monitoring in more than 70% of their consultations. The results also show that most providers relied on parental reporting of milestones achieved as opposed to direct observation of children's milestone achievements for developmental monitoring, even though the current child health consultation norms require both questioning and observation. Additionally, it must be noted that 49% of HWs stated that they considered how the child did on the anthropometric measures when completing the ECD register, and only 24% said they considered the child's developmental milestones. The latter finding confirmed what had been reported anecdotally in some sites regarding accuracy of registers. The way the register is being filled out would suggest the intervention is not always taking place even if documented as such, and could also explain the low rate of children identified with a suspected delay.

Anthropometric assessment was not conducted fully, with only weight being measured in 82% of observations, and other anthropometric measurements such as height, head circumference, and mid-upper arm circumference being measured in few consultation observations (37%, 19%, and 13% respectively). With the recent integration of all anthropometric measurements into Ministry of Health (MOH) registers, it is expected that complete anthropometric assessment will be conducted for all children.

The average time observed for monitoring of developmental delays varied from 4 minutes (postpartum consultation, child at risk consultation [*consulta da criança em risco*, CCR], and well child consultation [*consulta da criança sadia*, CCS]) and to 5 to 6 minutes (sick child consultation [*consulta da criança doente*, CCD] and pediatric antiretroviral therapy [ART]); while for ECD counseling, the time varied from 5 minutes to 15 minutes (pediatric ART).

Time constraints resulting from high client volume and competing priorities in CCS and CCD were reported as the predominant barrier to following developmental monitoring and counseling guidelines as delineated in child health norms, and some providers mentioned they do not prioritize these interventions unless risk factors for developmental delays are identified. Making guidelines for developmental monitoring more tailored to the reality of consultations and more explicit with regard to who, when, and how development should be monitored may help improve performance. These guidelines need to consider additional study



findings that HF providers have, on average, about 5 minutes to conduct developmental monitoring and counseling, and therefore may need clear instructions on how to optimize this time for service provision (e.g., limiting developmental monitoring to specific ages).

The job aids developed and distributed under the project were on display and available for use in all HFs and in most consultation rooms. HWs perceived them as easy to use, and they were used by the majority of HWs who conducted the monitoring and counseling interventions. Of all the materials assessed (see Table 1 beginning on page 4), the most widely used tool for monitoring of development was the developmental milestones poster (used in 60% of observations), which is an important finding since the MOH recently approved this poster for nationwide use as part of CCS consultations, allowing for developmental monitoring to be promoted at scale and at low cost. The HW flipchart was the most used tool in counseling sessions (used in 51% of observation), but the MOH has made the decision to not reproduce this tool for nation-wide use. Both tools were considered easy to use and to understand by the HWs. On the other hand, the updated MOH Integrated Management of Childhood Illness (IMCI) job aid, which integrates ECD, was not present in more than half of observed consultations (in those touch points where it should have been found), and almost half of HWs had not received training on it. This may have resulted from several factors: the fact that training on the revised IMCI job aid had just taken place before study data collection began and that, according to the Provincial Health Directorate, the majority of trained staff had since taken leave to study and were not present in the HFs during data collection; the fact that the tool was predominantly used in CCD and opportunities to use it in other relevant consultations, such as CCR and pediatric ART, were missed; and the high cost of printing the tool. This limited the ability of this study to assess the use of this particular job aid.

In interviews, more than half of caregivers exiting a consultation reported they had not received any information on how to stimulate their child's development, which is consistent with HWs reported frequency of counseling provision (51% of HWs stated they were able to provide counseling to caregivers in between 30% - 70% of their consultations). However, close to half of the caregivers who reported in the first interview to have received counseling remembered the messages in the follow-up interview, a month after the first. This suggests that measures may need to be taken to increase key message recall, such as ensuring that messages provided are relevant for the age and developmental stage of the child and that they address behavioral determinants that may impede or promote change; improving interpersonal communication skills; providing take-home materials; and improving use of behavior modeling techniques and toys during counseling.

This study suggests that integration of developmental monitoring and counseling into routine HF services by HWs in Maputo Province is beginning to be established. Based on experiences of integrating other interventions into routine maternal and child health services, such as HIV screening and counseling, family planning, and others, introduction of developmental monitoring and counseling will take time. Training, mentoring, and supervision of providers, and provision of information, education, and communication materials are important but may not be sufficient. A stronger enabling policy environment may be needed to support more robust implementation. While new CCS and CCD registers that integrate an ECD indicator were introduced at the end of 2018, and CCS and CCR clinical norms are currently being revised to be aligned with the new registers, the MOH may need to issue directives to the provinces to promote adequate data collection and analysis of this indicator at the local level, including setting targets for detection of developmental delays based on prevalence of disabilities, acute malnutrition, and other key risk factors; and ensure that data trends are being monitored at all levels and feedback is provided to inform decision-making. The results of this study should be taken into account during revision of child health consultation norms so that guidelines for feasibly, consistently, and effectively conducting developmental monitoring and

counseling are integrated, given time constraints experienced by HWs. For instance, the guidelines could indicate specific ages at which physical and brain development are at a critical stage and should therefore be monitored (i.e., 3, 9, 18, and 24 months), and the use of more sensitive child development assessment tools could be considered since a lower proportion of children would be monitored for development. Additional structural measures such as reinforcing developmental monitoring and counseling in pre-service and in-service training curricula and in quality assurance/quality improvement tools for maternal and child health may be essential for more robust implementation.

---

## Introduction

Approximately 250 million children under 5 years old in low- and middle-income countries are at risk of not reaching their developmental potential.<sup>1</sup> More than 66% of these children live in sub-Saharan African countries and are exposed to multiple risks, including poverty, malnutrition, poor health, and home environments with few learning opportunities. These factors adversely affect their cognitive, physical, and socio-emotional development.<sup>2</sup>

Young children in Mozambique, especially those living in disadvantaged settings such as rural areas and urban poor settings are most at risk. Responsive care and stimulation during the critical window of opportunity from conception to 3 years of a child's life are key ingredients for promoting optimal child growth and development and can buffer children from the negative effects of some of the risk factors.

One of the key recommendations from *The Lancet* 2017 Early Childhood Development series<sup>3</sup> is the need for routine maternal and child health and nutrition services to expand their scope to integrate early childhood development (ECD) content. In the early years of a child's life, routine health and nutrition services are often the only means to consistently and regularly reach children and their caregivers. Children who are not adequately stimulated in their early years may not reach their developmental potential in life and may experience lifelong disparities in health, academic achievement, and earning potential compared to children who have benefited from such stimulation.

## Context

As of the 2017 national census, Mozambique had a total population of 27,909,798.<sup>4</sup> By most economic measures, Mozambique is one of the poorest countries in Africa, although its economy is rising and there is hope that it will achieve the United Nations Sustainable Development Goals for poverty. The gross national income per capita is US\$1,210, which is considerably less than the regional average of \$3,714 and the global average of \$17,043.<sup>5</sup> Maputo Province, one of 11 provinces in the country, has a total population of 1,908,078 of whom 28% live in rural areas and 72% live in urban areas.<sup>5</sup>

According to the 2011 Demographic and Health Survey,<sup>6</sup> published in 2013, Mozambique had achieved significant reductions in child mortality. The under-5 mortality rate decreased from 158 per 1,000 live births in 1996–2001 to 97 per 1,000 live births in the period 2006–2011. The infant mortality rate declined from 106 per 1,000 live births to 64 per 1,000 live births within the same period.<sup>6</sup>

While more and more children are surviving, an unacceptably large number of children fail to thrive and reach their full developmental potential in life. Using 2015 data, estimates indicate that more than 60% of young children in Mozambique are at risk of poor development nationally.<sup>7</sup>

Over the past few years, the Mozambican government—supported by partners such as the United Nations Children's Fund, World Health Organization, US Agency for International Development (USAID), Conrad N. Hilton Foundation, and PATH—has recognized the importance of ECD and the critical role the health sector plays in providing counseling on age-appropriate stimulation, monitoring children's developmental milestones, and referring cases of serious developmental delays.

Since 2016, USAID/Mozambique has partnered with the Conrad N. Hilton Foundation and PATH in an innovative public-private partnership to support the government of Mozambique to systematically scale up

the provision of child development counseling and monitoring services through facility- and community-based health services in Maputo Province. The approach of this partnership is focused on ongoing capacity-building of service providers and their supervisors in specific health system touch points that reach children aged 0 to 3 years and their caregivers, through training, mentoring, and supportive supervision.

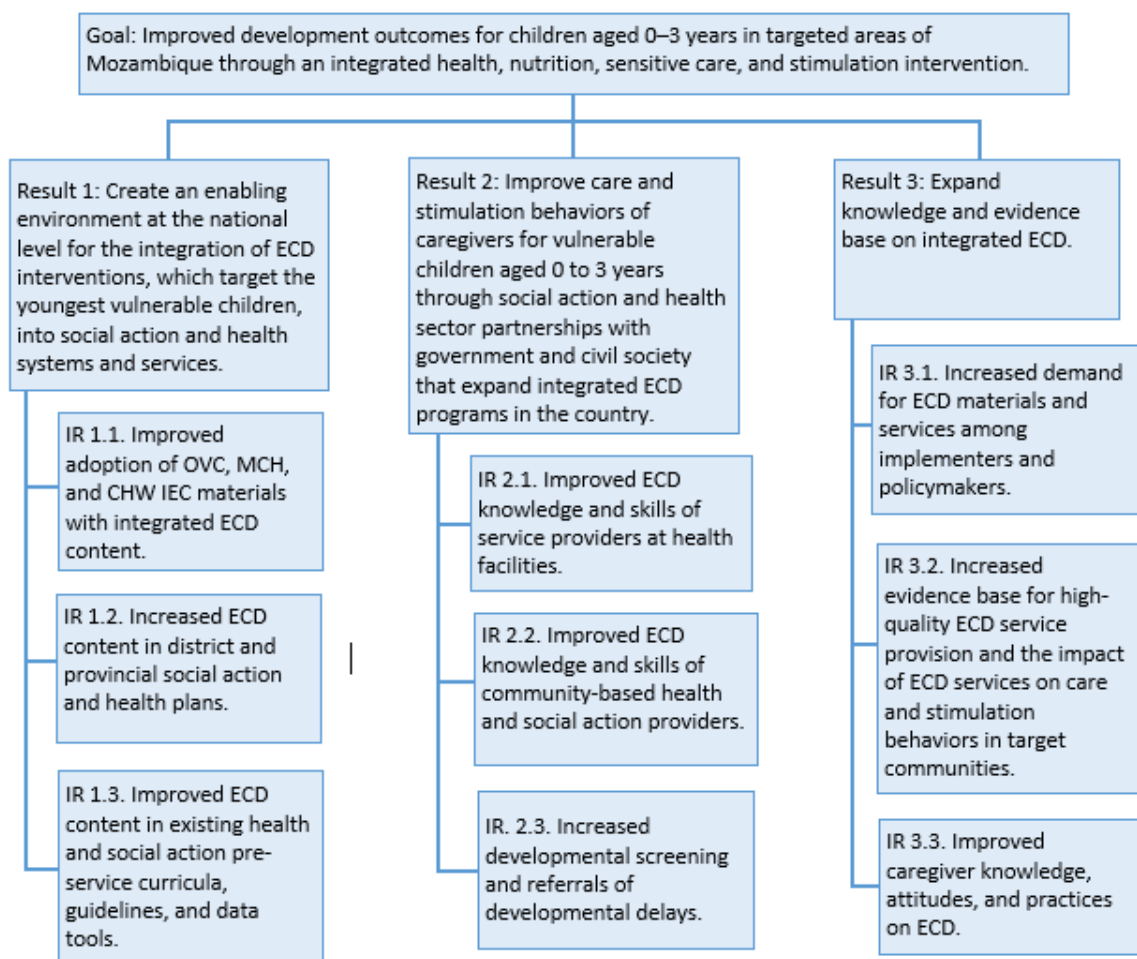
This partnership aims to improve the capacity of health workers (HWs) to monitor child development for early identification of developmental delays and referral for specialized care; promote improved caregiver awareness, sensitivity, and responsiveness to a young child's learning and emotional needs, and through that to improve childcare practices; and stimulate early learning opportunities by demonstrating when and how providers can interact with their children and in that way stimulate their development. PATH's integrated ECD model has three core components:

1. Integration of age-specific ECD monitoring and counseling into routine health facility (HF) services by clinical service providers, such as nurses and clinical officers.
2. Integration of ECD monitoring and counseling into routine home visits by community health workers (CHWs).
3. Playbox sessions in HF waiting areas led by HF auxiliary staff (counselors, cleaners), in order to make these spaces more child friendly and integrate ECD counseling into lengthy wait times.

Through this public-private partnership, nearly all facility-based health service providers (437) and all 212 community health workers of Maputo Province have been trained and supported to deliver ECD services as part of their routine care. This partnership has yielded the first fully scaled-up model of a health system-based ECD program in Africa and has reached a total of 395,207 beneficiaries—including caregivers and children under 5 years—with ECD and nutrition counseling in HFs.

Figure 1 on the following page shows the complete results framework for this intervention in Mozambique.

Figure 1. Results framework for ECD intervention in Mozambique.



Abbreviations: CHW, community health worker; ECD, early childhood development; IEC, information, education, and communication; IR, intermediate result; MCH, maternal and child health; OVC, orphans and vulnerable children.

To assist in the integration of developmental monitoring and stimulation activities into routine health service provision, PATH has developed job aids and communication materials for specific touch points or audiences, as described in Table 1.

Table 1. PATH ECD materials used in intervention HFs in Maputo Province.

Name of document	Where this is placed/used within the health facility	Audience	Description	Intended future use
Distributed in 2015 and currently in use in the 41 intervention health facilities in Maputo Province				
Health worker flipchart for counseling on stimulation and nutrition	On the nurse's desk at Antenatal Care Clinic, Postnatal Clinic, Well Child Clinic, Child at Risk Clinic, Sick Child Clinic, Pediatric ART Clinic.	Facility-based HWs	<p><i>Objective and intended use:</i> As a visual job aid for counseling caregivers on age-specific and child-specific (ex., premature child) nutrition and stimulation practices.</p> <p>These "Nutrition and Stimulation Counseling Cards" complement the counseling materials in use at HFs.</p> <p><i>Content/components:</i> Instructions for behavior modeling; instructions on ECD consultation tasks; screener for risk factors; antenatal care counseling guidance on fetus development, nutrition, and screener for maternal violence; postnatal counseling on newborn developmental danger signs, nutrition, kangaroo mother care, newborn massage, and stimulation; counseling guidance on nutrition and stimulation by age group; instructions for observing caregiver-child interaction; screener and counseling guidance for maternal depression; and a simplified monitoring chart for developmental milestones by age group.</p>	The tool was produced as a stand-alone ECD/nutrition counseling tool to address the lack of such tools at HFs. However, through advocacy, ECD content was integrated into posters approved by the MOH, as well as into IMCI and other MOH-provided tools. The flipchart is expensive to produce (colors and number of pages), so based on the MOH's adoption of the other tools, it will not be used outside of Maputo Province.

Name of document	Where this is placed/used within the health facility	Audience	Description	Intended future use
<p>Poster of simplified monitoring chart for developmental milestones (also referred to as “Simplified ECD Monitoring Poster” in this report)</p>	<p>Consultation room wall at Well Child Clinic, Child at Risk Clinic, Sick Child Clinic, Pediatric ART Clinic.</p>	<p>Facility-based HWs and caregivers</p>	<p><i>Objective and intended use:</i> Identify children not reaching key developmental milestones and refer to specialists on an as-needed basis. In addition, to review with the caregiver the main developmental milestones for the child, by age group.</p> <p><i>Content/components:</i> A simplified monitoring chart for developmental milestones by age group. The tool is based on IMCI and on the milestones in the child health card. It mostly assesses motor and language milestones, but a few components can be used to assess overall social and cognitive development. Not all areas are assessed in each age group—hearing and vision are primarily screened within the first months of life.</p>	<p>The MOH has asked to reproduce this poster for the whole country. Close to 700 posters have been printed with MOH approval and have been distributed nationally. UNICEF is ready to support additional printing for the remaining HFs.</p> <p>The main use will be in the Well Child Clinic to support the introduction of the new register, which includes the ECD indicator.</p>
<p>Poster of general stimulation activities (also referred to as “ECD General Stimulation Activities Poster” in this report)</p>	<p>Consultation room wall at Well Child Clinic, Child at Risk Clinic, Sick Child Clinic, Pediatric ART Clinic.</p>	<p>Facility-based HWs and caregivers</p>	<p><i>Objective and intended use:</i> Counseling tool to provide caregivers with stimulation activities to perform with their children.</p> <p><i>Content/components:</i> Shows stimulation activities that can be carried out during common daily routines (not by age).</p>	<p>The MOH has asked to reproduce this poster for the whole country. Close to 700 posters have been printed with MOH approval and have been distributed nationally. UNICEF is ready to support additional printing for the remaining HFs.</p> <p>The main use will be in the Well Child Clinic, to support generic/preventive counseling.</p>

Name of document	Where this is placed/used within the health facility	Audience	Description	Intended future use
In process of being distributed to all health facilities in Maputo Province				
Wall cards on postnatal care	Maternity ward wall.	Facility-based HWs and caregivers	<p><i>Objective and intended use:</i> Visual job aid for HWs to counsel caregivers on newborn care, nutrition, and danger signs before discharge from the maternity ward.</p> <p><i>Content/components:</i> Twelve A3-sized cards with postnatal guidance on danger signs for both mother and newborn, nutrition, stimulation, and other basic newborn care.</p>	<p>Approved for use by the Provincial Health Directorates of Maputo and Nampula.</p> <p>National approval and use of this tool will depend on results of the evaluation of current use. Results and material will be presented to the MOH for review.</p>
Poster of Well Child Clinic consultation	Consultation room wall at Well Child Clinic or outside the room door.	Facility-based HWs and caregivers	<p><i>Objective and intended use:</i> Educate caregivers about services offered as a part of a well child consultation (including developmental monitoring and stimulation) and to increase demand for these services as a result.</p> <p><i>Content/components:</i> Shows seven key services of a well child consultation, including developmental monitoring and counseling on nutrition and stimulation.</p>	This material is currently being reviewed by the MOH. It is planned that it will be integrated into all PATH-supported implementation settings.
Poster of complementary feeding guidance	Consultation room wall at Well Child Clinic, Child at Risk Clinic, and used in morning talks in the waiting room.	Facility-based HWs and caregivers	<p><i>Objective and intended use:</i> Educate caregivers of children 6 months and older about age-specific complementary feeding recommendations, with specific emphasis on protein-rich foods.</p> <p><i>Content/components:</i> Complementary feeding guidelines by age group (6–8 months, 9–11 months, 12 months–5 years).</p>	This material has been approved by the Provincial Health Directorates of Maputo and Nampula. The material was submitted for national (MOH) approval, and comments have been received. It is planned that it will be integrated into all MOH-supported interventions.

Abbreviations: ART, antiretroviral therapy; ECD, early childhood development; HF, health facility; HW, health worker; IMCI, Integrated Management of Childhood Illness; MOH, Ministry of Health; UNICEF, United Nations Children's Fund.



For the ECD monitoring and counseling components taking place in routine HF clinical services, a baseline evaluation of provider performance was completed in 2016, and monthly mentoring sessions of providers have been conducted in all six intervention districts, prioritizing the three facilities in each district that have the highest volume of patients. Table 2 shows the intervention activities that were completed as of June 2017 (or by the time this operational research was initiated).

Table 2. PATH ECD intervention activities in Maputo Province as of June 2017.

District	Number of HFs where HWs have been trained	Number of facility-based HWs trained	Number of facility-based HWs mentored at least three times	Number of initial ECD material sets <sup>a</sup> distributed
Magude	7 (3 full packages)	26	7	14
Manhiça	4 (3 full packages)	31	9	13
Marracuene	9 (3 full packages)	43	16	19
Matutuine	13 (3 full packages)	40	16	19
Moamba	6 (3 full packages)	35	5	15
Namaacha	10 (3 full packages)	45	17	17
<b>Total</b>	<b>49 (18 full packages)<sup>b</sup></b>	<b>220</b>	<b>70</b>	<b>97</b>

Abbreviations: ECD, early childhood development; HF, health facility; HW, health worker.

a. An initial ECD set includes a HW flipchart for complete ECD consultation, a developmental monitoring poster, and a general stimulation poster. The numbers displayed are the low-end estimates based on the consultation touch points.

b. Includes six level I facilities (district health centers) and 43 level II facilities (peripheral health centers). "Full package" means that three facilities in each district were prioritized for frequent mentoring activities.

The analysis of monthly HF data summaries for ECD suggests that since the project started, a relatively small percentage of children have been identified and referred for developmental delays, considering estimated prevalence reported in the literature. For example, acute malnutrition is strongly associated with developmental delays.<sup>2</sup> Approximately 2% of children in Maputo Province have acute malnutrition,<sup>6</sup> so one would expect the number of children with developmental delays to be at least as high, considering other risk factors too. Additionally, a study in KwaZulu-Natal Province in South Africa found that 6% of children aged 0 to 10 years had some type of developmental disability.<sup>8</sup>

Between April and June 2017, it was reported 511 children in Maputo Province, monitored during child at risk consultation (CCR); of these, only seven (1.4%) were reported to have had a developmental delay and been referred to the next level of care. These data are recorded by the providers in the government consultation registries, in the "Observations" column, and then summarized by the ECD focal point person. It is not clear if these low percentages are due to low data quality (discrepancy between the monitoring activities reported and those actually taking place), barriers faced by HWs in being able to conduct monitoring properly, low validity and reliability of the simplified monitoring tools, and/or a true low prevalence of developmental delays in Maputo. In September 2017, during a process review of the ECD scale-up in Kenya and Mozambique, it was reported that data quality issues had been identified. In one example, HWs were recording ECD activities in the "Observations" column at the HF registry even when counseling had not taken place, reportedly because they were instructed to mark that column whenever any child under 3 years of age presented in the clinic. Corroborating monitoring and referral trends in a systematic way by a third party and identifying factors that led to these results was warranted.

---

## Evaluation aim and objectives

### Study aim

The aim of this study was to assess if the integration of PATH's ECD monitoring and counseling materials into a facility-based setting in Maputo Province led to increased early detection and referral of developmental delays, and to identify the factors that influenced the outcome.

### Specific objectives

1. Document trends in ECD monitoring and referral to specialists since the integration of PATH's ECD monitoring and counseling materials in 2015 in Maputo Province.
2. Assess the performance of facility-based HWs as it relates to following the monitoring and counseling approach outlined in the PATH HW flipchart and HW use of PATH's monitoring and stimulation posters; and identify factors that influence HW performance.
3. Assess the usability of PATH's monitoring and counseling posters among facility-based HWs, and factors that influence their use.
4. Assess the performance of facility-based HWs as it relates to following the updated Ministry of Health (MOH) Integrated Management of Childhood Illness (IMCI) job aid (as it pertains to the ECD section); and identify factors that influence HW performance.

### Secondary objective

5. Assess caregivers' ability to recall key ECD messages and their intention to act after being exposed to ECD counseling in a HF.

---

## Evaluation methodology

### The study site

This evaluation was carried out in six of the eight districts of Maputo Province, where PATH has supported the government to integrate ECD intervention into routine health services. The ECD project covered 49 health units, including 18 HFs where the complete ECD package was implemented (Table 2). HFs that received the complete package were those that received more frequent technical support and mentoring of HWs from PATH project staff.

### Methods

The present evaluation used mixed methods (qualitative and quantitative) with non-probabilistic (purposive) sampling. The quantitative data collected from the integrated consultation logbooks (with ECD content) were used exclusively to illustrate the trend of early detection and reporting of cases of developmental delays and referrals of children during the PATH intervention period (May 2016 to December 2018). For qualitative data, direct observation of consultations where ECD monitoring and counseling were implemented and in-depth interviews were used.

The following data collection tools were used to determine the study variables:

1. Consolidated database of monthly ECD reports from the 49 HFs of the intervention area, from May 2016 to December 2018, for ECD consultation and referral of children under 3 years age (Appendices 1 and 2), to document the trends in detection of developmental delays and referrals during the project life.
2. Integrated consultation observational ECD checklist applied in the 18 HFs where the complete ECD package was implemented (Appendix 3), to assess the performance of HWs in monitoring and counseling for development and nutrition, and use of the three initial ECD materials and the MOH IMCI job aid.
3. An in-depth interview questionnaire (Appendix 4), to explore the use, experience, challenges, and suggestions of HWs regarding the flipchart, monitoring and stimulation posters, and IMCI job aid.
4. Self-administered questionnaire (Appendix 5), to assess HW opinions regarding three of the materials that are recommended for continued use beyond the project (the PATH monitoring and stimulation posters and the MOH's updated IMCI job aid [ECD sections]).
5. In-depth interview questionnaire (Appendix 6), to determine the perception and retention of key messages about nutrition and stimulation by caregivers who received ECD counseling, as well as the caregivers' intention to act after exposure to postpartum consultation (CPP), sick child (*consulta da criança doente*, CCD), pediatric antiretroviral treatment (ART), and well child (*consulta da criança sadia*, CCS) consultations.

### Sampling and sample size

The evaluation was based on a purposive (non-probabilistic) sample composed of the 18 HFs that received the complete PATH ECD package. Of the approximately 70 eligible health professionals expected to participate in the study (who received at least three mentoring visits prior to the study), only 37 were found on location during the evaluation period. A significant portion of these HWs had been transferred to other HFs inside or outside the province and others were out of service or in training.

Each HW was subjected to two observations, and the same 37 HWs were given an in-depth interview and responded to a self-administered questionnaire.

Four physiotherapists working in district HFs, who observed and treated children referred to them within the project period, were also interviewed.

Finally, 237 caregivers older than 18 years of age, of both sexes, who attended a CCS, CCD, CCR, CPP, or ART pediatric visit with a child under 3 years of age were randomly selected for an interview at the end of their consultation. Between 23 and 30 days after the first interview, the caregivers were again interviewed to evaluate retention of the key messages received during the previous consultation at the HF. In total, 133 caregivers participated in the second interview.

## **Training of field team and pilot**

The LAC A Molecular consultant acted as the principal facilitator in the training of research assistants and their supervisors. The interviewers were recruited by LAC A Molecular, and all possessed previous experience with similar types of research. The training covered the following topics.

- Study methodology: Overview of qualitative data collection, objectives of study, sampling techniques, and respondent selection.
- Interview techniques and ethics, including specific advice on code of conduct, dress, choice of words, appropriate introductions, interviewee consent, ensuring confidentiality, etc.
- Review of the questionnaires: Structure, conceptual content, relevance of questions, and translations to local languages.
- Pre-testing and role-plays highlighting various tricky and sensitive interview scenarios and plenary discussion of possible solutions.
- Supervisors received additional training on data collection logistics, sampling, data handling, and study oversight.

During the training, the study questionnaires and procedures were pre-tested in one HF of the study area (Centro de Saúde de Mumemo). Each research assistant administered two questionnaires to HWs and caregivers and conducted one consultation observation. The pre-testing helped to inform the duration of each interview and evaluate the level of understanding of the questions among both the interviewers and the respondents, as well as alert to any potential difficulties in filling out the questionnaire.

## **Data collection**

Prior to the start of data collection, a team of two research assistants from LAC A Molecular visited each district and HF of the study area to:

- Obtain the necessary credentials and authorizations from the respective District Services for Health, Women and Social Affairs.
- Locate and map the HWs in service and eligible for the study in each of the 18 selected HFs. The plan for data collection was developed based on this mapping.

Between September 22 and November 19, 2018, the research team proceeded to collect data in the 18 selected HFs in the study area. All participants (HWs and caregivers) were provided the respective informed consent prior to consultation observation or in-depth interviews. The observations were made in CCD, CCS, CCR, CPP, and pediatric ART consultation where an eligible HW was in service. Caregivers of children under 3 years of age were recruited from the aforementioned consultations.

Parallel to this work, action was taken to collect data on the cases of developmental delays that were detected and referred. Data on detection of developmental delays were extracted from maternal and child health record books. Data on children who were referred for developmental delays were collected

from physiotherapy registers in six district HFs. Four physiotherapists in service at these HFs were also interviewed.

## **Data management and analysis**

All paper-based questionnaires were checked for completion, and the contents were then validated by the principal investigator. All HW and caregiver personal identifiers were removed before entry into the electronic repository.

In order to estimate the trends of integration of ECD into health services, PATH created and maintained a monitoring and evaluation database that included information from the 49 HFs of the study area. These data were triangulated to detect ECD integration trends and identify cases of developmental delays during the active lifetime of the PATH project. A linear trend analysis was used to estimate the trends.

Mixed methods were used for data collection—specifically, direct observation of HWs during consultations, interviews with HWs and caregivers, and a self-administered Likert scale questionnaire for health providers. Qualitative and quantitative methods were used for the data analysis, such as frequency and content analysis.

---

## Study limitations

This assessment was conducted in specific HFs selected through purposive sampling (non-probabilistic), and as such, the generalizability of its findings may be limited.

Recruitment of the original target sample of HWs was not possible. Of the 70 HWs on record as providing services in the 18 target HFs, only 37 were found in the respective HFs at the time of the study. Moreover, 74 HW observations were expected (2 observations per HW), but often this was not possible because after the first observation, the HW was absent and another HW not eligible for the study was working in their place. Of the five physiotherapists initially planned for participation in the study, it was possible to interview only four (the fifth declined to participate).

To document trends of developmental monitoring and referrals, the study had originally aimed to include the data collected from the 49 HFs starting in 2014, before the PATH ECD intervention had been implemented. Unfortunately, upon review of the existing information, data inconsistencies were discovered before May 2016, explained by use of different data collection tools and poor reporting rates from districts. This limited the ability to document a trend, given that the intervention began in January 2015 in Matutuine, Namaacha, and Marracuene, and in February 2016 in Moamba, Magude, and Manhiça.

The low number of observations done in CCR and pediatric ART consultation also constitutes a limitation of the study, considering these children were most at risk for poor development and therefore it would have been important to know whether developmental monitoring and counseling were adequately integrated into these services.

In terms of caregiver interviews, it was sometimes not possible to elicit an answer from caregivers for certain questions, despite probing. This could possibly be explained by low literacy of caregivers, inability to recall an answer, concern for making a mistake, or lack of motivation in participating actively in the study. This limited the ability of the study team to better understand the caregivers' experience interacting with the HWs and their recall of messages, and identify barriers to their understanding beyond socioeconomic ones.

## Study results

### General characteristics of study participants

In all, 37 eligible HWs were observed and interviewed. Table 3 provides the names of the 18 HF's from which participants were recruited. As shown in the table, most of the HWs recruited for the study were medical technicians (46%) and nurses (46%). No medical doctor who received ECD training under the PATH project was available to participate in the study.

Table 3. Cadre of HWs per HF and district.

District	Health facility	Medical doctor	Medical technician	Nurse	Nutritionist	Other	Total
Moamba	CS Moamba	0	0	2	0	–	2
	CS Ressano Garcia	0	1	1	0	–	2
	CS Sabié	0	1	0	0	–	1
	Total	0	2	3	0	0	5
Namaacha	CS Namaacha	0	2	0	0	–	2
	CS Mafuiane	0	2	1	1	–	4
	CS Mahelane	0	0	1	0	–	1
	Total	0	4	2	1	0	7
Matutuine	CS Matutuine	0	1	1	0	–	2
	CS Salamanga	0	2	1	0	–	3
	CS Hindane	0	1	1	0	–	2
	Total	0	4	3	0	0	7
Marracuene	CS Marracuene	0	2	1	0	1	4
	CS E. Mondlane	0	0	1	0	–	1
	CS Mumemo	0	1	1	0	–	2
	Total	0	3	3	0	1	7
Manhiça	CS Manhiça	0	2	0	0	–	2
	CS Xinavane	0	0	2	0	–	2
	CS Mwatibuana	0	1	0	0	–	1
	Total	0	3	2	0	0	5

District	Health facility	Medical doctor	Medical technician	Nurse	Nutritionist	Other	Total
Magude	CS Magude	0	1	2	1	–	4
	CS Motaze	0	0	1	0	–	1
	CS Moine	0	0	1	0	–	1
	<b>Total</b>	<b>0</b>	<b>1</b>	<b>4</b>	<b>1</b>	<b>0</b>	<b>6</b>
<b>Total</b>	<b>18 health facilities</b>	<b>0 (0%)</b>	<b>17 (46%)</b>	<b>17 (46%)</b>	<b>2 (5%)</b>	<b>1 (3%)</b>	<b>37 (100%)</b>

Abbreviation: CS, Centro de Saúde.

A total of 237 caregivers were interviewed, but only 133 were available for a follow-up interview. Table 4 below shows that the majority of caregivers had children less than 12 months old, in both the first (71%) and follow-up (72%) interview groups, and most of them were the mothers of the children (95% and 94% in the first and second interview groups, respectively). The majority of children had attended only CCS (61% and 62%, respectively), and a nurse was the most common HW to provide a consultation (57% and 42%, respectively).



Table 4. General characteristics of children and caregivers enrolled for first and second (one-month follow-up) interviews.

Characteristics	Moamba		Namaacha		Matutuine		Marracuene		Manhiça		Magude		Total	
	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd	1st	2nd
Age of child														
0–3 months	4	3	14	6	4	2	13	5	4	2	14	10	53	28
3–5 months	2	1	3	2	2	1	7	4	8	5	6	2	28	15
6–9 months	10	5	9	7	7	6	6	2	9	7	12	4	53	31
10–12 months	2	2	2	3	7	5	9	5	7	4	8	3	35	22
13–24 months	6	5	8	3	4	3	14	5	8	6	3	0	43	22
25–36 months	3	2	8	5	3	3	7	2	3	2	1	1	25	15
<b>Total</b>	<b>27</b>	<b>18</b>	<b>44</b>	<b>26</b>	<b>27</b>	<b>20</b>	<b>56</b>	<b>23</b>	<b>39</b>	<b>26</b>	<b>44</b>	<b>20</b>	<b>237</b>	<b>133</b>
Kinship of caregiver														
Mother	25	17	39	23	26	19	54	23	39	26	41	17	224	125
Father	0	0	4	1	0	0	0	0	0	0	0	0	4	1
Grandmother/Grandfather	1	1	1	2	0	0	1	0	0	0	3	3	6	6
Legal caregiver	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	1	0	0	0	1	1	1	0	0	0	0	0	3	1
<b>Total</b>	<b>27</b>	<b>18</b>	<b>44</b>	<b>26</b>	<b>27</b>	<b>20</b>	<b>56</b>	<b>23</b>	<b>39</b>	<b>26</b>	<b>44</b>	<b>20</b>	<b>237</b>	<b>133</b>
Attended at														
CPP	0	0	3	2	1	1	8	5	2	1	1	1	15	10
CCR	2	2	3	1	1	2	1	1	4	4	2	1	13	11
CCD	11	9	10	6	5	5	17	5	7	0	6	4	56	29
Pediatric ART	0	0	4	1	0	0	3	0	0	0	1	0	8	1
CCS	14	7	24	16	20	12	27	12	26	21	34	14	145	82
<b>Total</b>	<b>27</b>	<b>18</b>	<b>44</b>	<b>26</b>	<b>27</b>	<b>20</b>	<b>56</b>	<b>23</b>	<b>39</b>	<b>26</b>	<b>44</b>	<b>20</b>	<b>237</b>	<b>133</b>
Attended by <sup>a</sup>														
Medical doctor	0	1	5	0	0	0	1	0	0	0	0	0	6	1
Med. Technician	10	5	9	5	0	0	23	9	5	3	14	12	61	34
Nurse	12	8	28	10	9	6	24	12	34	18	29	2	136	56
Nutritionist	0	0	2	1	0	0	1	1	0	0	1	0	4	2
Other	5	4	0	10	18	14	7	1	0	5	0	6	30	40
<b>Total</b>	<b>27</b>	<b>18</b>	<b>44</b>	<b>26</b>	<b>27</b>	<b>20</b>	<b>56</b>	<b>23</b>	<b>39</b>	<b>26</b>	<b>44</b>	<b>20</b>	<b>237</b>	<b>133</b>

Abbreviations: ART, antiretroviral therapy; CCD, sick child consultation (*consulta da criança doente*); CCR, child at risk consultation (*consulta da criança em risco*); CCS, well child consultation (*consulta da criança sã*); CPP, postpartum consultation. 1st, first interview done at last consultation; 2nd, second interview 23 to 30 days after 1st interview (follow-up interview). a. HW category identified/mentioned by the caregivers.

## Objective 1: Document trends in ECD monitoring and referral to specialists since the integration of PATH's ECD monitoring and counseling materials in 2015 in Maputo Province.

Project implementation started in January 2015 in Matutuine, Namaacha, and Marracuene, and in February 2016 in Moamba, Magude, and Manhiça. The data entered into the PATH project database from May 2016 to December 2018) show that in the study area, 770,772 children under 3 years attended their first CPP, CCD, CCS, CCR, and pediatric ART consultation. Of this total, 77% were monitored for developmental delays and only 0.4% were identified with a suspected delay in one or more developmental milestone (Table 5).

The district with the highest percentage of monitoring for developmental milestones was Moamba, with 93% of children monitored; the district with the lowest percentage was Marracuene, with 63%. The rate of detection of cases of developmental delays was similar among the districts (between 0.2% in Magude and 0.5% in Manhiça and Matutuine).

Table 5. Number of children seen at CPP, CCD, CCS, CCR, and pediatric ART consultation and percentage of children under 3 years monitored for ECD milestones in HFs of the study area, May 2016 to December 2018.<sup>a</sup>

Variable	Moamba	Namaacha	Matutuine	Marracuene	Manhiça	Magude	Study area total
Total number of children seen <sup>b</sup>	150,469	80,622	49,950	177,592	200,272	111,867	770,772
Children monitored for developmental milestones	139,886	64,071	40,881	111,550	147,672	86,600	590,660
	93%	79%	82%	63%	74%	77%	77%
Children monitored with good development <sup>c</sup>	139,499	63,814	40,686	111,136	146,950	86,418	588,503
	99.7%	99.6%	99.5%	99.6%	99.5%	99.8%	99.6%
Children monitored with a suspected developmental delay <sup>d</sup>	387	257	195	414	722	182	2,157
	0.3%	0.4%	0.5%	0.4%	0.5%	0.2%	0.4%
Trend points	2,882	1,003	482	1,663	3,677	1,387	11,093

a. Data source: Data collection tools developed by PATH and introduced in the HFs for monitoring of the intervention.

b. Number of children seen in CPP, CCR, CCD, CCS, and pediatric ART consultation during the period May 2016 to December 2018.

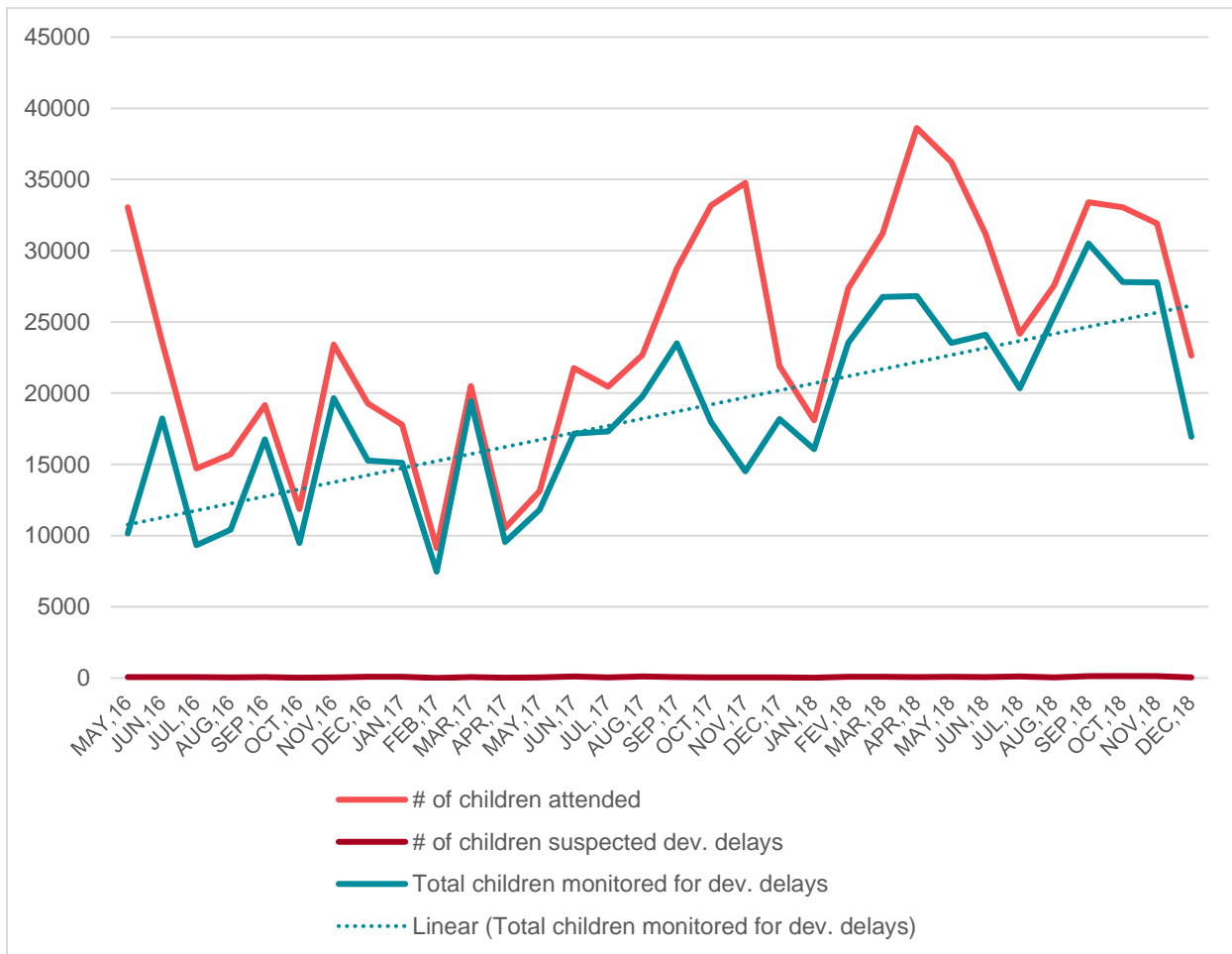
c. Children with good development/who had achieved developmental milestones related to their age.

d. Children with any kind of developmental delay suspected by the HW.

e. Trend points are the points that compose the trend line, which is the line that represents the behavior of a set of data to determine if there is a certain pattern. A trend line is an analytical tool used to determine if a set of points exhibits a positive trend, a negative trend, or no trend at all. In this case, the trend points/line were calculated using Microsoft Excel.

Overall, the number of children monitored for developmental milestones from May 2016 to December 2018 showed an increasing trend (11,093 trend points), with Manhíça showing the most positive trend at 3,677 points (Figure 2). The district with the lowest growth trend of developmental milestone monitoring was Matutuíne (482 points). Figure 2 shows the increasing linear trend of number of children monitored for developmental delays across the study period.

Figure 2. Trends in ECD monitoring in the study area from May 2016 to December 2018.



We used physiotherapy data to evaluate trends in referrals of suspected developmental delays. Physiotherapy and rehabilitation services are a proxy for specialist services, considering that most cases of developmental delays in the first 3 years are physical in nature; therefore, physiotherapy is the sector that traditionally receives the largest proportion of children with developmental delays compared with other specialist services. Table 6 shows that a total of 380 children under 3 years with developmental delays were seen in physiotherapy and rehabilitation services at HFs located in the four district headquarters (Marracuene, Moamba, Magude, and Manhiça) and in PATH-supported outreach services in Matutuine and Namaacha Districts from May 2016 to December 2018. Of these, 78% of children had been referred internally from within the same HF, while 22% had been referred by a peripheral HF.

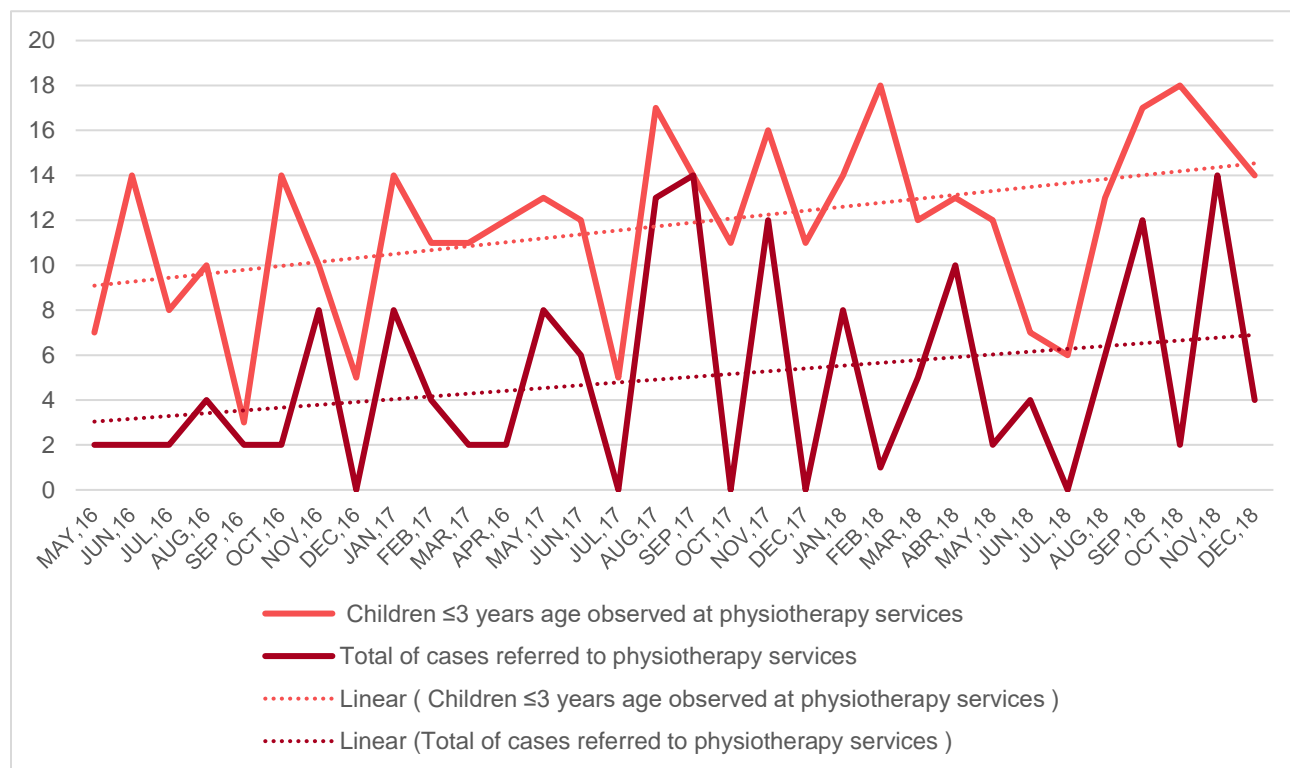
Table 6. Children seen at physiotherapy services of district headquarter HFs, by referring district, May 2016 to December 2018.

Variable	Moamba	Namaacha	Matutuine	Marracuene	Manhiça	Magude	Study area total
Total number of children seen at physiotherapy services (at district headquarter HFs)	45	23	23	172	85	32	380
Children referred to physiotherapy services by district headquarter HF itself (intra-referral)	30 (67%)	18 (78%)	15 (65%)	144 (84%)	63 (74%)	27 (84%)	297 (78%)
Children referred to physiotherapy services by peripheral HFs (inter-referral)	15 (33%)	5 (22%)	8 (35%)	28 (16%)	22 (26%)	5 (16%)	83 (22%)

Abbreviation: HF, health facility.

Figure 3 shows a linear growth trend in the number of children under 3 years of age seen at the physiotherapy services of district headquarter HFs from May 2016 to December 2018, in all six districts.

Figure 3. Trend in number of children who attended physiotherapy services compared to the total number of children referred by HFs, May 2016 to December 2018.



Physiotherapists considered that the project contributed to an increase in referrals, as it improved HWs' knowledge of the importance of early referral of children identified with developmental delays:

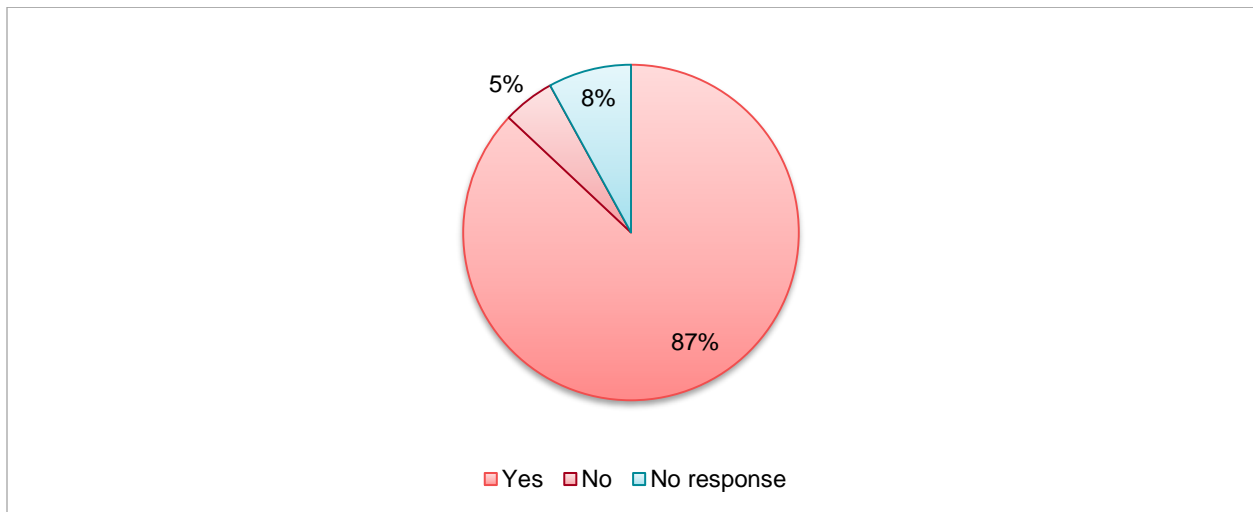
*The referrals increased. After training on ECD, technicians from other sectors came to know the importance of physical therapy and to refer more children.*

*It increased the number of children with asphyxia referred to physical therapy and who end up diagnosed with developmental problems.*

Special mention should be made regarding the impact of PATH support on the physiotherapy sector in Matutuine and Namaacha Districts, where no physiotherapy services existed and where PATH therefore assisted the health services to receive a monthly physiotherapy outreach team from the provincial hospital. The physiotherapy data generated in these districts are a result of the work of this outreach team, as no children received physiotherapy in Namaacha and Matutuine prior to this period.

The trend in increased referrals appears to have been bolstered by the availability of ECD materials used for the identification of children with suspected developmental delays. In all, 87% of HWs reported they felt they were identifying more children with developmental delays since the ECD materials became available (Figure 4).

Figure 4. Percentage of HWs who felt they had identified more children with developmental delays after the ECD materials became available (n = 37).



Examples of why HWs (n = 32) considered that PATH-developed job aids led to more identification of developmental delays:

*Because with the materials the HW got awakened and now they know how to identify and differentiate the parameters.*

*Because it is through the material that I can identify at what age the child should do what.*

*Because before having the material it was difficult to provide the advice and referral according to the age.*

*Because the training and the material we have helps to identify certain aspects.*

*Because with this material it is already possible to know if the reflexes are good or not and to be able to follow up on the treatment.*

*Because the material helps identify developmental aspects or delays of the child.*

*Because the material is explicit and facilitates the diagnosis and counseling in ECD.*

*Because posters help me identify and refer children.*

*Because the materials have more information that helps in guiding caregivers.*

## **Objective 2: Assess the performance of facility-based HWs as it relates to following the monitoring and counseling approach outlined in the PATH HW flipchart and HW use of PATH’s monitoring and stimulation posters; and identify factors that influence HW performance.**

Facility-based HW performance, as it related to following the monitoring and counseling approach described in the PATH HW flipchart, was evaluated using an *"in situ"* direct observation approach of two consultations administered by each HW trained under the PATH project.

The average service time of the HWs who were observed and interviewed was 4.5 years of work experience within the health system; 38% of HWs stated they had received the last ECD training between January and

September 2018, while 51.3% reported they had been trained between 2015 and 2017; the remaining 11% did not remember when they had been trained. The average number of ECD-related supervision and mentoring visits received by these HWs was 3.5 visits.

Due to several limitations (please see “Study limitations,” page 12) related to the availability of trained HWs, only 63 of the 74 potential observations were conducted; the highest percentage of observations recorded (59%) was for CCS (Table 7). The very small number of observations conducted in pediatric ART services is due to the fact that most children seen there were older than 5 years, beyond the required age range for ECD services.

Table 7. Number of HWs and number of consultations observed, by type of service.<sup>a</sup>

Health facility	Number of HWs observed	Number of observations	Type and number of consultations observed					
			CPP	CCR	CCD	Pediatric ART	CCS	Total
CS. Moamba	2	3	–	–	–	–	3	3
CS Sabie	1	2	–	–	1	–	1	2
CS Ressano	2	4	1	1	–	–	2	4
Moamba District	5	9	1	1	1	0	6	9
CS Namaacha	2	4	–	2	–	–	2	4
CS Mafuiane	2	5	1	1	–	–	3	5
CS Mahelane	2	4	1	–	–	1	2	4
Namaacha District	6	13	2	3	0	1	7	13
CS Matutuíne	2	4	–	–	2	–	2	4
CS Salamanga	2	4	1	–	1	–	2	4
CS Hindane	2	2	–	–	–	–	2	2
Matutuíne District	6	10	1	0	3	0	6	10
CS Marracuene	3	6	2	2	–	–	2	6
CS Ed. Mondlane	1	2	–	–	–	–	2	2
CS Mumemo	2	2	–	–	–	–	2	2
Marracuene District	6	10	2	2	0	0	6	10
CS Manhiça	3	4	–	2	–	–	2	4

Health facility	Number of HWs observed	Number of observations	Type and number of consultations observed					
			CPP	CCR	CCD	Pediatric ART	CCS	Total
CS Mwatibyana	1	2	–	–	–	–	2	2
CS Xinavane	2	4	1	–	–	–	3	4
Manhiça District	6	10	1	2	0	0	7	10
CS Magude	5	7	–	1	2	1	3	7
CS Motaze	2	2	–	–	2	–	–	2
CS Moine	1	2	–	–	–	–	2	2
Magude District	8	11	0	1	4	1	5	11
<b>Total</b>	<b>37</b>	<b>63</b>	<b>7</b>	<b>9</b>	<b>8</b>	<b>2</b>	<b>37</b>	<b>63</b>

Abbreviations: ART, antiretroviral therapy; CCD, sick child consultation (*consulta da criança doente*); CCR, child at risk consultation (*consulta da criança em risco*); CCS, well child consultation (*consulta da criança sadia*); CPP, postpartum consultation; CS, Centro de Saúde; HW, health worker.

a. Some HWs were observed in more than one consultation type; some were observed only once due to lack of availability for an additional observation.

Table 8 shows the mean length of time to complete a consultation that included ECD components (mean of 12.1 minutes; range 2–28 minutes); and that counseling (counseling on the issue that was the purpose of consultation, and ECD counseling), took 54% of the whole consultation time, (mean 6.5 minutes; range 0–22 minutes). This appears to be in line with common consultation protocols such as in IMCI, whereby treatment and counseling are given equal attention.

Table 8. Average time (in minutes) taken by HWs to complete consultations (including ECD components).

District	Number of observations	Complete consultation (integrating ECD components)	Developmental monitoring	Counseling (all inclusive)
Moamba	9	9.0 (2.0–28.0)	3.2 (1.0–10.0)	5.7 (0.0–18)
Namaacha	13	16.9 (5.0–25.0)	5.1 (2.0–10.0)	9.1 (3.0–20.0)
Matutuine	10	14.7 (5.0–25.0)	4.8 (1.0–10.0)	5.5 (1.0–12.0)
Marracuene	10	9.1 (4.0–25.0)	3.4 (1.0–6.0)	5.5 (1.0–19.0)
Manhiça	10	12.6 (5.0–25.0)	4.0 (1.0–10.0)	7.3 (1.0–22.0)
Magude	11	8.8 (7.0–12.0)	3.5 (1.0–9.0)	5.3 (3.0–10.0)

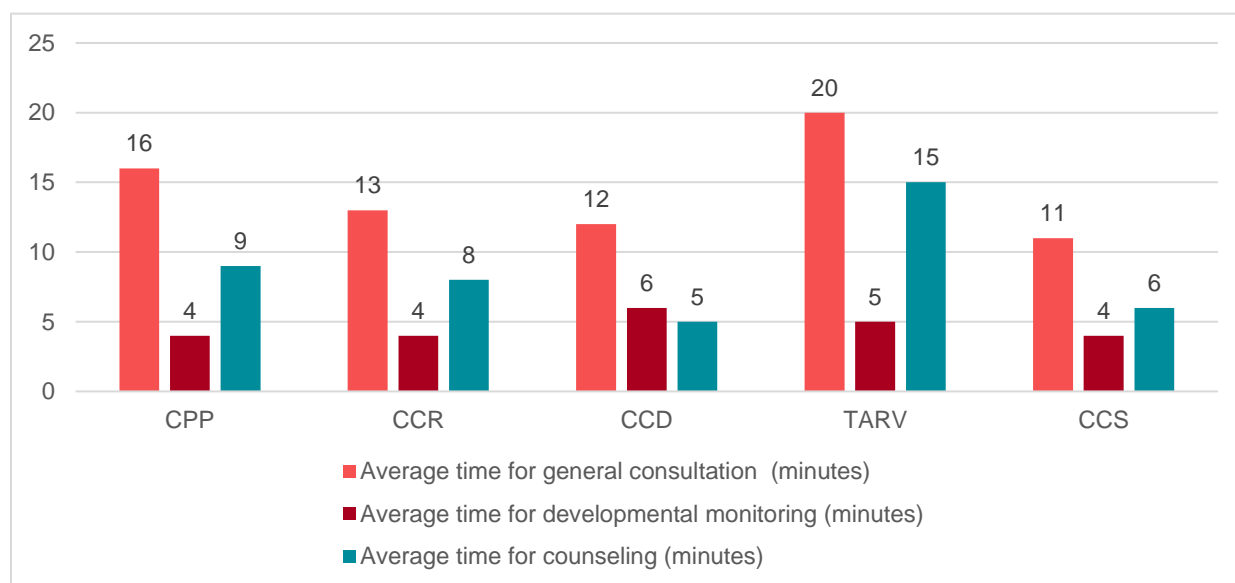


<b>Total: Average and range</b>	<b>63</b>	<b>12.1 (2.0–28.0)</b>	<b>4.1 (1.0–10.0)</b>	<b>6.5 (0.0–22)</b>
---------------------------------	-----------	------------------------	-----------------------	---------------------

Abbreviation: ECD, early childhood development.

Figure 5 shows the average duration of each type of consultation. Pediatric ART was observed to have the longest mean time at 20 minutes (only two consultations were observed), and CCS the shortest at 11 minutes. The average time taken to conduct developmental monitoring ranged from 4 to 6 minutes.

Figure 5. Average time for general consultation, developmental monitoring, and counseling.



Abbreviations: CCD, sick child consultation (*consulta da criança doente*); CCR, child at risk consultation (*consulta da criança em risco*); CCS, well child consultation (*consulta da criança sadia*); CPP, postpartum consultation; TARV, pediatric antiretroviral therapy.

Health professionals interviewed said they spent an average of 12 minutes administering a complete consultation that included ECD components (consistent with the average time of 12 minutes observed during consultations), but considered the ideal time to complete such a consultation, on average, would be 23 minutes (Table 9). CCR was perceived by HWs as requiring the most time (31 minutes). This conveys again the time constraint that HWs experience in being able to deliver the intervention fully.

HWs estimated spending 19 minutes on average in CCD, but 9 minutes in CCS. During observations, it was indeed recorded that CCD takes slightly longer (12 minutes) than CCS (11 minutes), but the discrepancy between the time HWs actually spent and what they believed they spent in CCD is large.

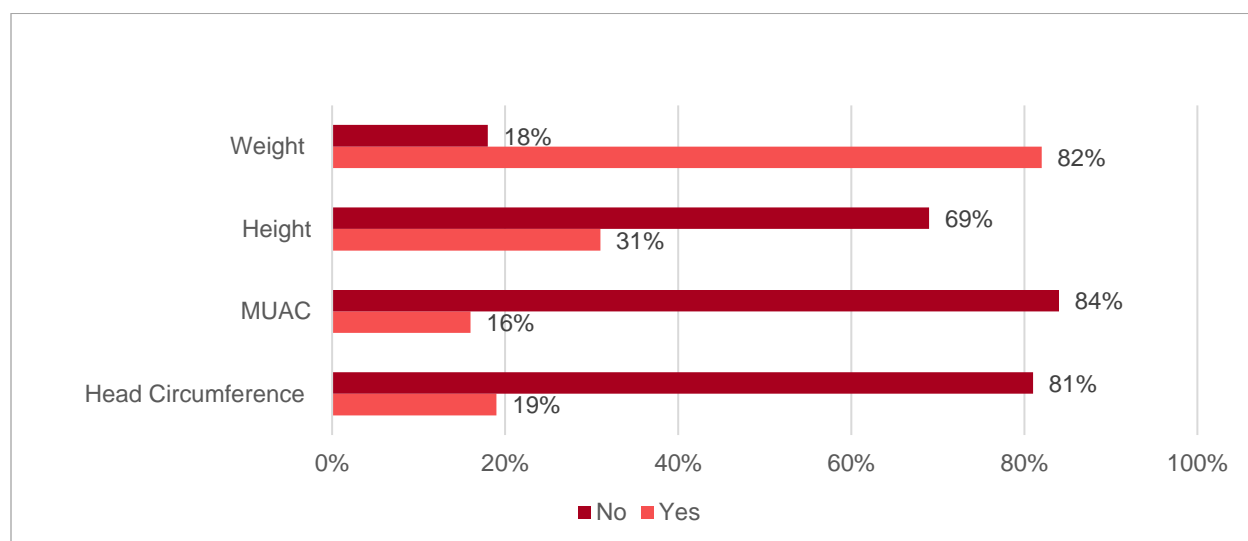
Table 9. Average time HWs spent to complete a consultation that included ECD versus ideal time needed to complete the same consultation in different services, as reported by HWs (n = 37).

Type of consultation	Real time expended by health workers to perform one consultation: Average number of minutes (range)	Ideal time needed to perform one consultation: Average number of minutes (range)
Child at risk (CCR; n = 11)	15 (6–30)	31 (15–60)
Sick child (CCD; n = 7)	19 (10–45)	29 (15–60)
Pediatric antiretroviral therapy (n = 7)	14 (10–30)	22 (10–60)
Well child (CCS; n = 26)	9 (2–20)	18 (2–30)
<b>Total: 37<sup>a</sup></b>	<b>12 (2–45)</b>	<b>23 (2–60)</b>

a. Some of the 37 respondents provided answers for more than one service in which they worked.

During the consultations, it was observed that no anthropometric measurements were consistently checked. Weight was most commonly assessed by the HWs (in 82% of observations), and mid-upper arm circumference was the one least assessed, closely followed by head circumference (Figure 6).

Figure 6. Anthropometric data measurements taken by HWs during consultations (n = 63).



Abbreviation: MUAC, mid-upper arm circumference.

Furthermore, 72% (45) of consultations observed (Figure 7) included systematic monitoring of child developmental milestones using the available job aids. In other consultations (28%), only basic anthropometric measures were evaluated, such as child's weight and height. Attention to developmental monitoring is likely a result of continuous mentoring in ECD received by providers; it will be important to ensure the government takes on quality improvement activities for both developmental and growth monitoring after the project ends, to make sure this performance is maintained.

Figure 7. Monitoring of ECD milestones during the consultations (n = 63).

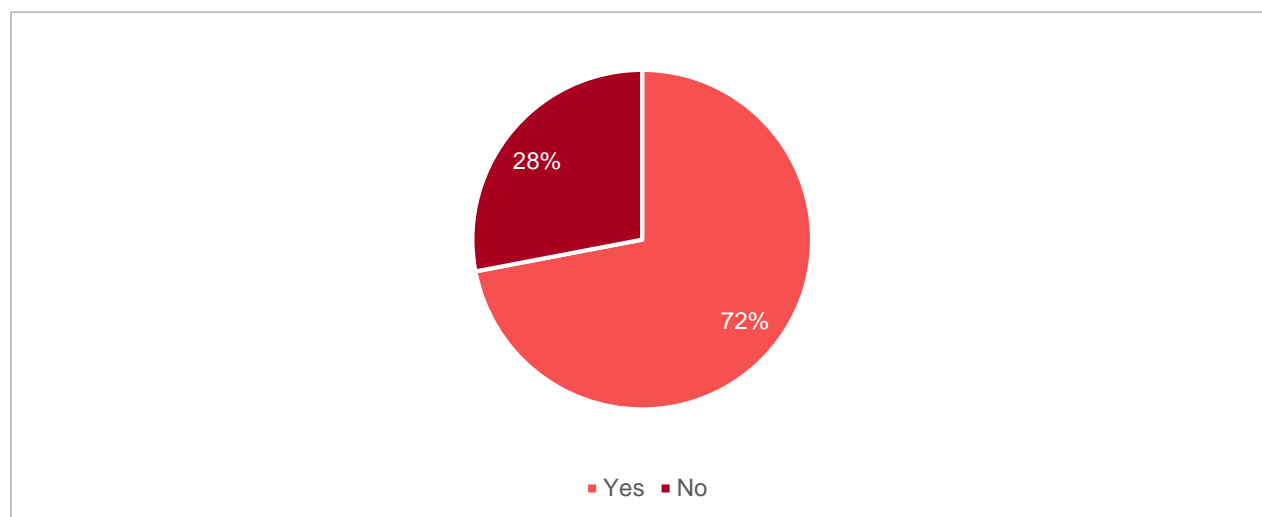
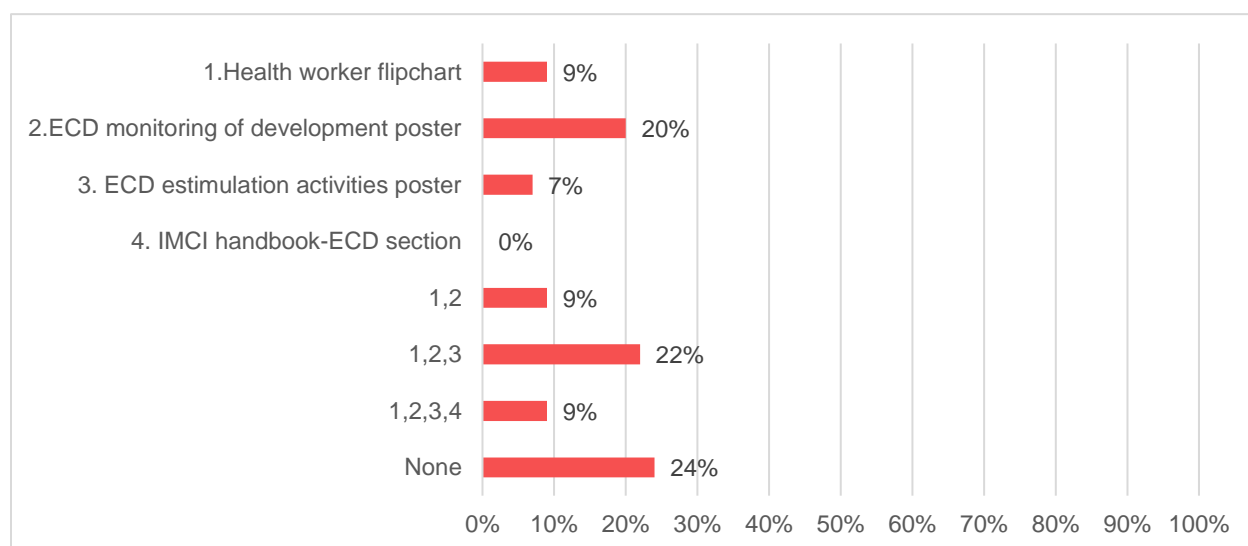


Figure 8 shows that during the 45 observations in which HWs monitored developmental milestones, in more than three-quarters (76%), the HW used at least one or more job aids during the consultation. The most frequently used job aid for monitoring of development was the ECD monitoring poster, used in 60% of observations either on its own or in combination with other tools. This is a promising finding, considering the MOH has approved the use of this poster nationwide as part of CCS consultations, to promote developmental monitoring at scale and at low cost. In 24% of 45 observations, the HW did not use any tool for monitoring child development, and the IMCI job aid (ECD section) was used only in combination, never alone.

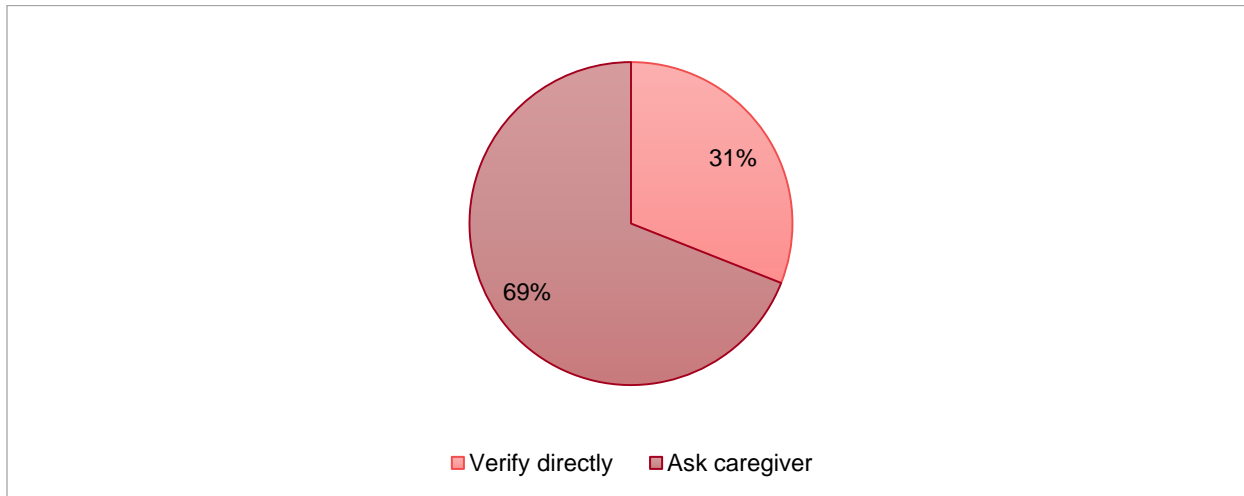
Figure 8. Job aids used by HWs during consultation to help in monitoring development (n = 45).



Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness.

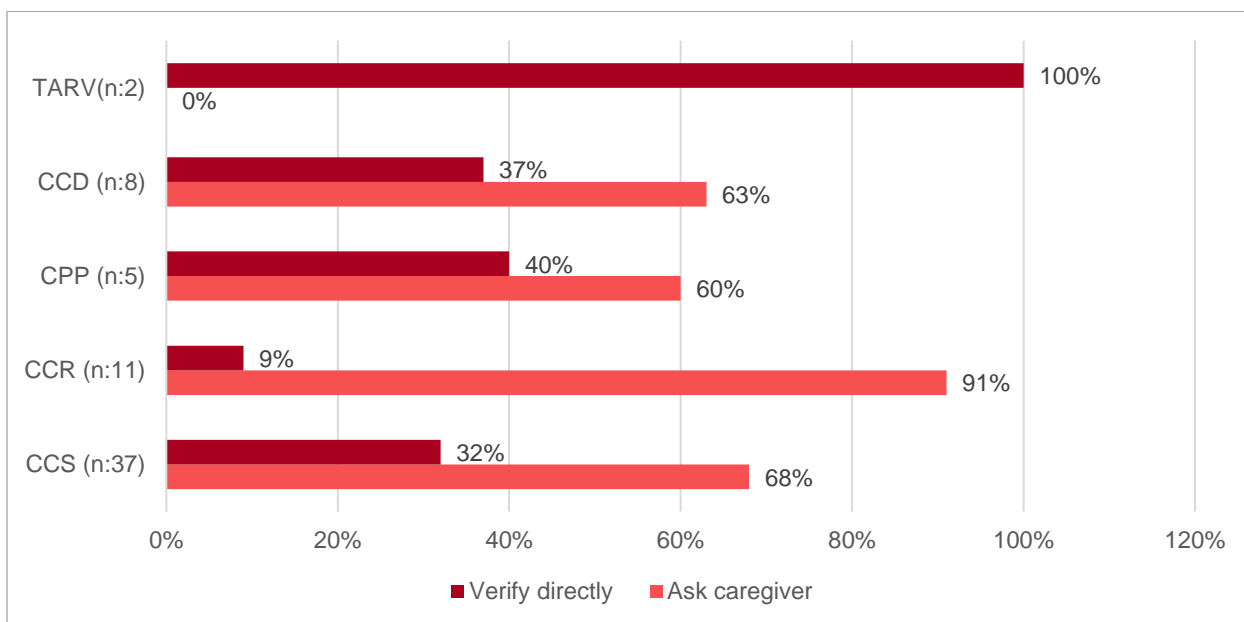
Observers also noted that in 69% of consultations in which developmental milestones were monitored, the HW asked the caregiver about the ECD milestones instead of verifying directly when evaluating the child (Figure 9).

Figure 9. Percentage of HWs who directly checked the child’s milestones or asked the caregiver (n = 63).



Analyzing by type of consultation, results show the majority of HWs asked caregivers instead of verifying developmental milestones by evaluating the children directly, with 68% of providers doing so in CCS, 91% in CCR, 60% in CPP, and 63% in CCD. Pediatric ART consultation was an exception; providers evaluated the child instead of asking the caregiver in both consultations that were observed (Figure 10).

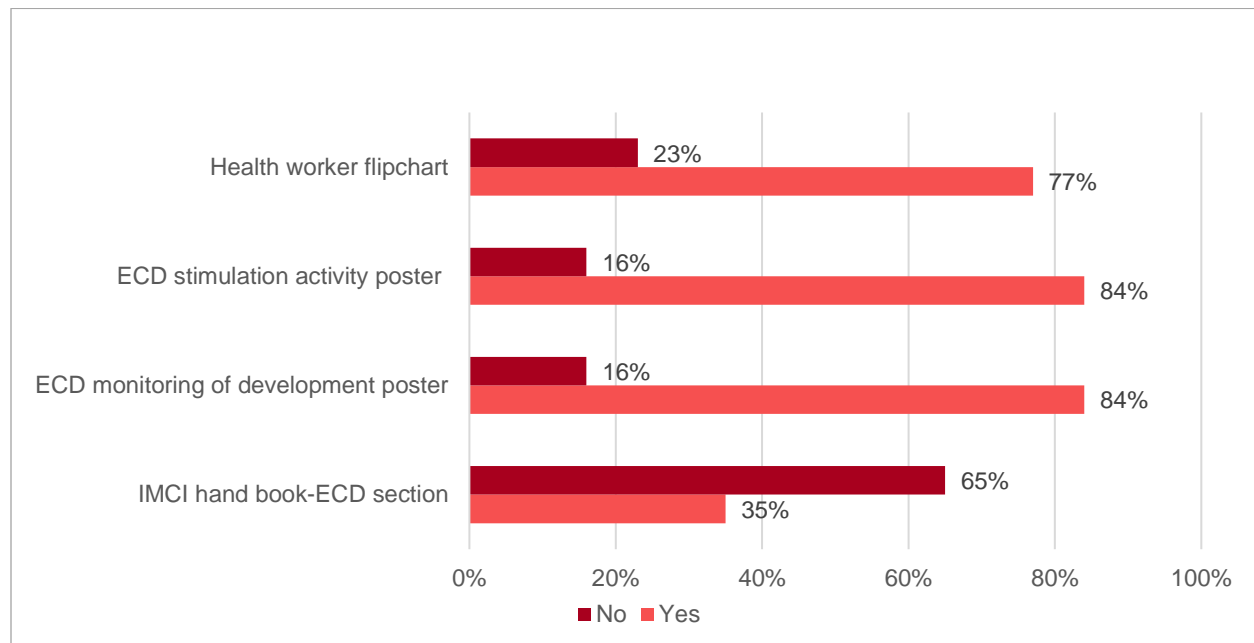
Figure 10. HW directly checked the child’s milestones or asked the caregiver, by type of consultation (n = 63).



Abbreviations: CCD, sick child consultation (*consulta da criança doente*); CCR, child at risk consultation (*consulta da criança em risco*); CCS, well child consultation (*consulta da criança sadia*); CPP, postpartum consultation; TARV, pediatric antiretroviral therapy.

While direct observation of CCS may be difficult due to limited consultation time, the current norms in both CCS and other consultations require it. Since monitoring every child at every contact may indeed not be feasible in high-volume consultations such as CCS, PATH will draw on the experiences of several other countries and advocate for moving to age-based monitoring (for example, all children at 3, 9, and 18 months could be monitored) when CCS norms come up for review in the near future. CCD is another setting for which norms for developmental monitoring may need to be adjusted, due to its high volume and the primary focus of treating the child's illness. PATH will continue to advocate for direct and frequent observation of child development in CPP, CCR, and pediatric ART due to the risk factors associated with the postnatal period and HIV and malnutrition, among others. PATH will work with national and international pediatric associations to help the MOH adapt the norms, bringing the study results to inform these discussions. Figure 11 summarizes information on the availability of tools during the consultations in which HWs asked the caregiver instead of directly evaluating the child for developmental milestones. Of note, the tools were available for most of these consultations (with the exception of the IMCI handbook, which is not used in CCS), suggesting that lack of tools was not a reason for not directly monitoring child development.

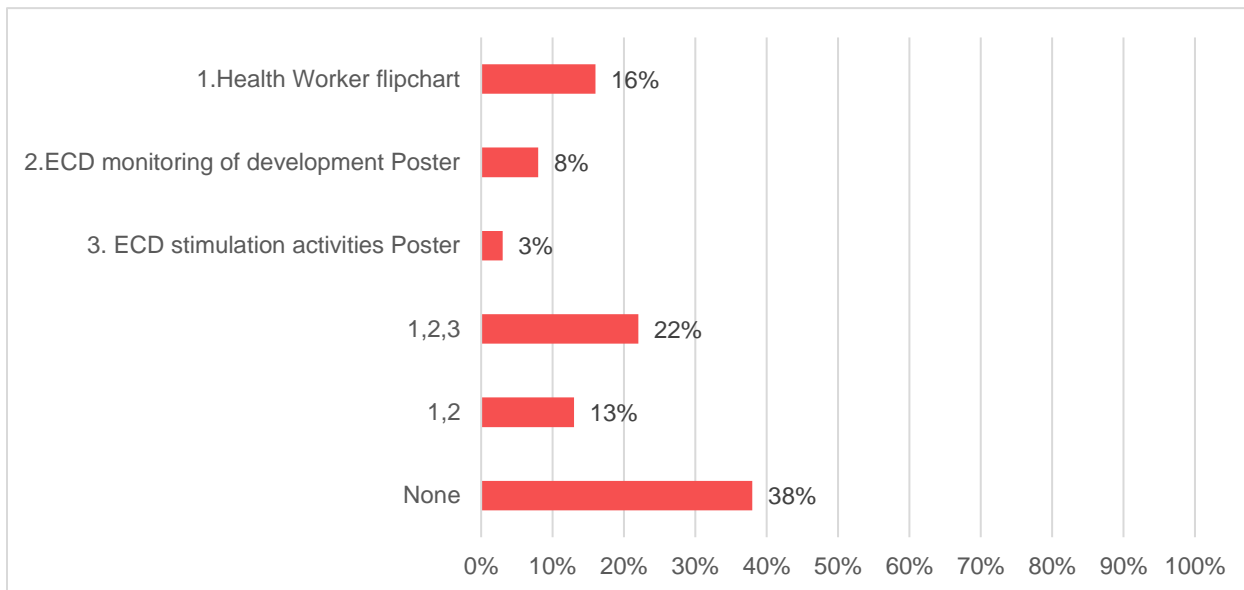
Figure 11. Availability of tools for ECD monitoring during observations in which the HW asked directly of the caregiver (n = 43).



Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness.

Figure 12 shows that in 62% of all 63 observations, the HW used one or more job aid provided by PATH. The most frequently used job aid for counseling was the HW flipchart, used in 51 % of observations, whether on its own or in combination with other tools. In 38% (24) of observations, the HW did not use any tool for counseling.

Figure 12. Job aids used by HWs during consultations (counseling) (n = 63).

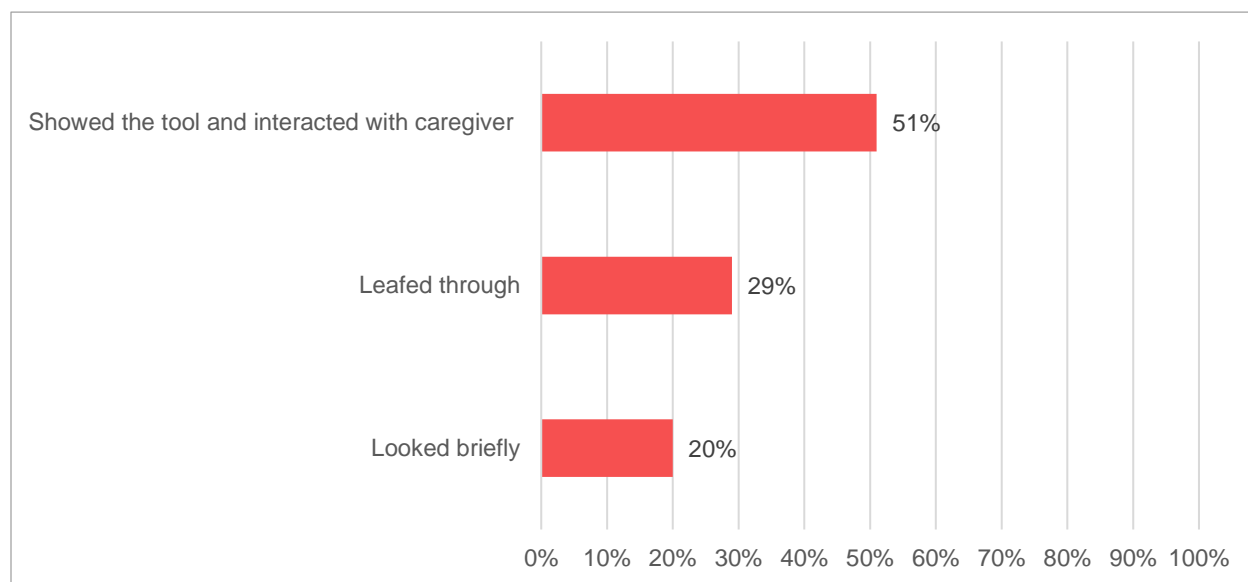


Abbreviation: ECD, early childhood development.

The use of the developmental milestones poster for counseling was also observed by PATH in the nationwide orphans and vulnerable children project, in which community activists relied on the poster to teach stimulation activities even when a separate visual aid on stimulation was available. There may be a need to further explore if it is indeed possible to use the same tool adequately for monitoring and counseling, which could result in lower-cost implementation.

Figure 13 presents the way HWs interacted with tools during the 39 observations in which the HW was observed using the tools. In all, 51% of HWs showed the tool to and interacted with the caregiver, 29% leafed through the tool, and 20% looked briefly to the tool during the counseling session.

Figure 13. Different ways HWs interacted with the tools during observed counseling (n = 39).



Examples noted during observations of interpersonal communication techniques applied and the content of counseling provided by HWs:

*The HW interacted with the caregiver and advised on feeding and caring for the child.*

*The HW interacted with the caregiver and advised on the position to breastfeed the child.*

*The HW told the mother how to take care of feeding and breastfeeding and the importance of stimulating the baby.*

*The HW verified the weight of the child and guided the caregiver on feeding the child. The HW interacted with the caregiver and advised on feeding and postpartum care for mother and child.*

*The HW interacted with the caregiver and spoke about the need to produce toys and feed his son well.*

When probed for the reasons for **not** systematically monitoring child development using the job aids, HWs relayed the following, by type of consultation.

- CCR: All HWs who did not conduct monitoring of child development mentioned high patient volume and therefore lack of time for this activity.
- CCD: Most HWs who did not conduct monitoring of child development mentioned that the child did not present any risk factors that required monitoring, and some mentioned the child was referred immediately as an emergency due to the severity of the case.
- Pediatric ART: High patient volumes and lack of time were the causes reported by all providers who did not perform monitoring of child development.
- CCS: High patient volumes and lack of time were the most common reasons reported by HWs who did not conduct monitoring of child development, followed by no risk factors that prompted them to monitor child development. A few providers mentioned referring the child to another sector within the HF before any assessment was done.

Table 10 summarizes the perspectives of HWs (n = 37) on factors that could help providers conduct monitoring of development and counseling more easily and frequently.

Table 10. Factors that could facilitate monitoring of development and counseling, according to HWs (n = 37).

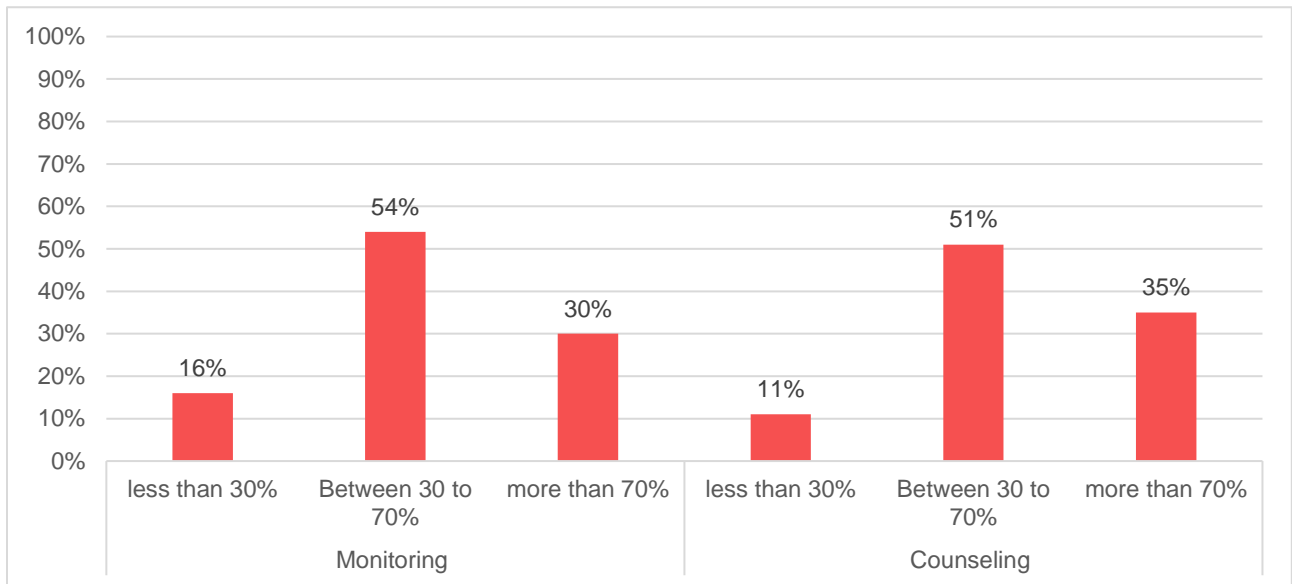
What could help health workers to conduct developmental monitoring?	What could help health workers to conduct counseling on stimulation?
<ul style="list-style-type: none"> <li>• Allocation of more materials/tools such as posters, flipcharts, videos, and toys to use during monitoring (10).</li> <li>• More staff trained in ECD (8).</li> <li>• More space to conduct child development monitoring in the rooms, and separation between vaccination and CCS (4).</li> <li>• There are all conditions (3).</li> <li>• More staff available to provide talks on ECD to caregivers (2).</li> <li>• Include age in weeks in the tools (2).</li> <li>• Use the developmental milestones (2).</li> <li>• More conversations with caregivers during the consultations (1).</li> <li>• Reduce the demand (1).</li> <li>• HF registry forms with ECD integrated (1).</li> <li>• Strengthening ECD in the talks for caregivers to implement and transmit in their communities (1).</li> <li>• More training in ECD (1).</li> <li>• There is no difficulty (1).</li> </ul>	<ul style="list-style-type: none"> <li>• Train and allocate more staff to conduct the activity, or allocate someone for counseling only (13).</li> <li>• Allocation of more tools/materials/toys, project videos, etc. (13).</li> <li>• Allocation of adequate space with more privacy for counseling (separate vaccination and CCS rooms) (5).</li> <li>• More willingness to work and empathy from HWs toward the caregivers (2).</li> <li>• Conduct more ECD talks (1).</li> <li>• There are all conditions (1).</li> <li>• More resources (1).</li> <li>• Record book that obligates HWs to register counseling data (1).</li> </ul>

Abbreviations: ECD, early childhood development; HF, health facility; HW, health worker.

Only a third of HWs stated they were able to conduct developmental monitoring in more than 70% of their consultations, and a similar number stated the same for counseling. About half of HWs reported they were able to conduct developmental monitoring in between 30% - 70% of their consultations, and a similar number stated the same for counseling (Figure 14).

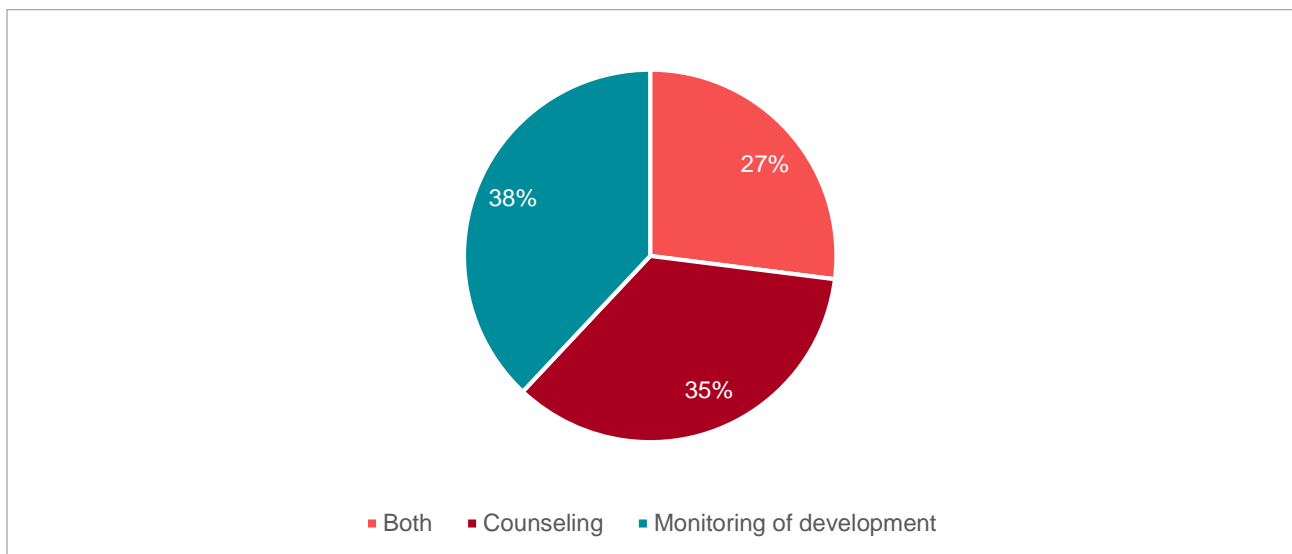


Figure 14. Percentage of consultations in which HWs reported they were able to conduct ECD monitoring and counseling (n = 37).



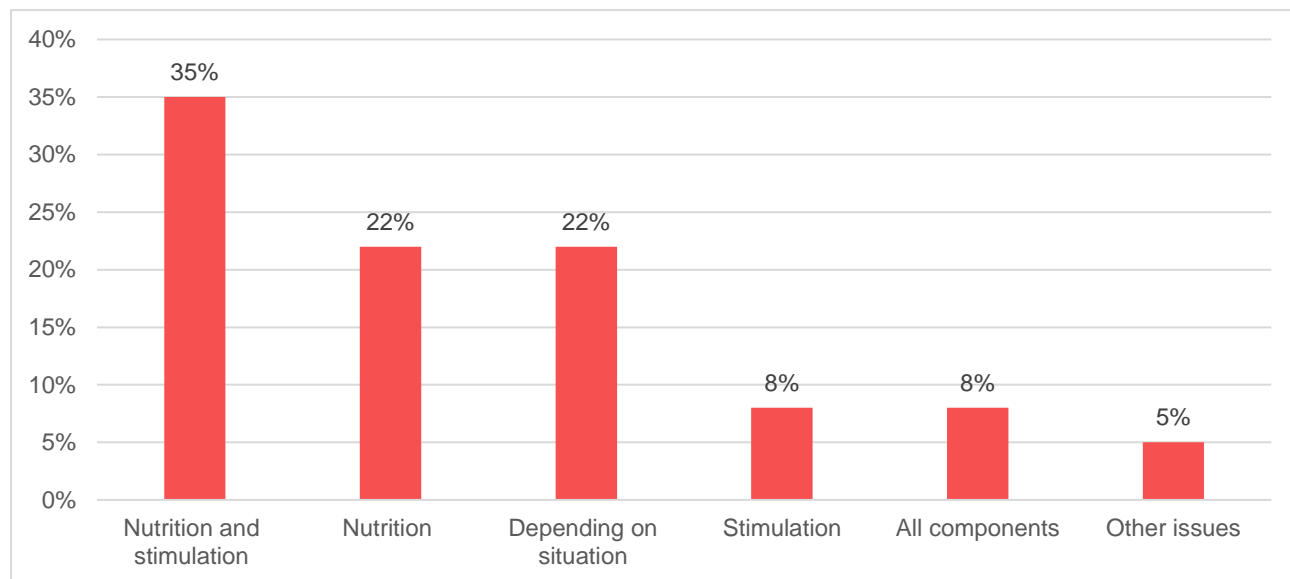
Thirty-eight percent of HWs chose ECD counseling as a priority when consultation time was limited due to high client demand (Figure 15 below).

Figure 15. Priority between monitoring and counseling in ECD, when consultation time was limited (n = 37).



When time was limited, the majority of HWs prioritized nutrition messaging—whether on its own or in combination with stimulation messages (Figure 16).

Figure 16. Messages prioritized by HWs when consultation time was constrained (n = 37).



Interestingly, stimulation alone as a counseling topic was not viewed as a priority, but stimulation in conjunction with nutrition counseling was seen as relevant by more than a third of providers, perhaps due to the fact that these topics are presented jointly in the flipchart.

About 50% of HWs considered all child consultations to be appropriate entry points to conduct ECD monitoring and counseling, 30% considered CCS as most appropriate, and 22% considered CCR and pediatric ART as the most appropriate entry points. The main reasons are detailed in Table 11.

Table 11. Best consultation or platform to conduct ECD monitoring and counseling and why.

Best consultation or platform to conduct ECD monitoring/counseling (n = 37)	Reasons
All consultations (49%)	<ul style="list-style-type: none"> <li>• All consultations because we have to work in an integrated way for the good of the child.</li> <li>• All consultations are important because the sectors are integrated.</li> </ul>
CCS (30%)	<ul style="list-style-type: none"> <li>• CCS because it is the gateway of all children and where possible diseases can be detected.</li> <li>• CCS because the child comes to a normal consultation and we detect the problem before the disease develops.</li> <li>• CCS because it is where it is possible to prevent diseases.</li> <li>• CCS because if a problem is detected in the child, a referral is made for the child to be treated.</li> </ul>
CCR and pediatric ART (22%)	<ul style="list-style-type: none"> <li>• CCR and pediatric ART because the child is at risk and needs more attention.</li> <li>• CCR and pediatric ART because it is where more care is needed in order to know if the child is already under treatment, and the type of feeding.</li> <li>• CCR and pediatric ART because it treats children who have a weak development.</li> </ul>

Abbreviations: ART, antiretroviral therapy; CCR, child at risk consultation (*consulta da criança em risco*); CCS, well child consultation (*consulta da criança sadia*).

The following are examples of what HWs thought about how practical or feasible it was to refer a child with developmental delays to a higher-level facility. The majority of HWs who responded to this question thought it was practical, but a few responded that it is not practical due to lack of financial resources for transport to the HF for a follow-up consultation.

*It is practical because of interconnection of all the health services and the system of referral.*

*It is practical because the high-level health facility has trained personnel to deal with these situations.*

*It is practical if the child has criteria to be referred.*

*It is practical because, being a child development problem, I need to go to other more equipped hospitals.*

*It is practical because I already did it before the training in ECD.*

*It is practical because there are children who are referred and they have had some improvements.*

*It is practical because the referral allows developmental delays corrections.*

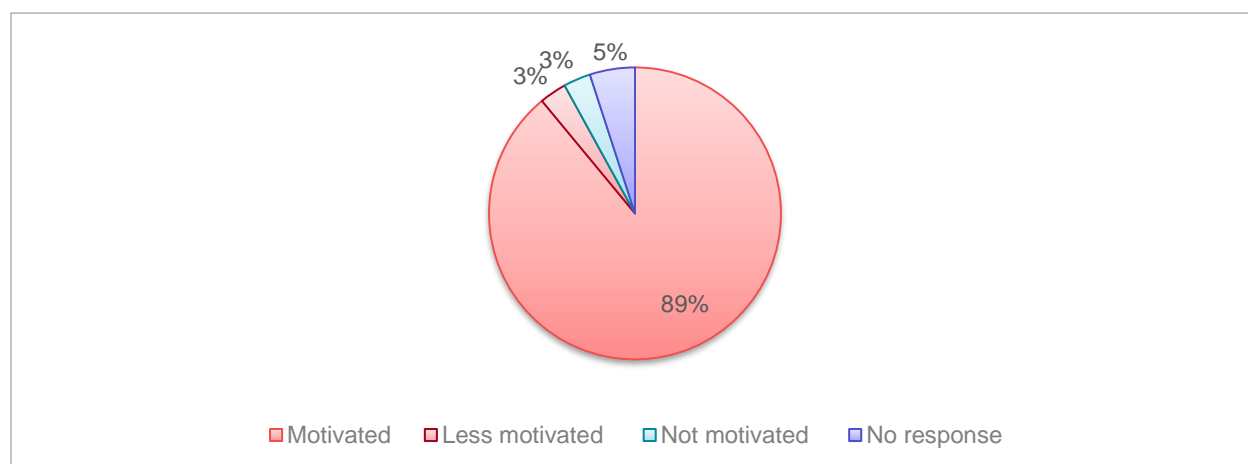
*It is not practical because when the reference is done the caregivers often not go due lack of resources [financial resources for transport to the health facility for follow-up consultation].*

*Is not practical, if we could do all consultations in the same health facility would be better. It becomes difficult for a mother to move to another health facility.*

Furthermore, HWs were asked how often they were able to record ECD-related activities in HF registers. Of the 37 HWs who responded, the majority (73%) said they always filled out the registers. When asked what they considered when writing ECD with an arrow up or down to indicate the state of the child's development in the "Observations" column, the majority (49%) said they were considering how the child did on the anthropometric measures; only 24% said they were considering the child's developmental milestones. This confusion, likely due to what constitutes ECD content, has been addressed with the introduction of new CCD and CCS registers, which contain a separate ECD indicator (i.e., the number of children with identified developmental delays).

As motivation, or lack thereof, is often reported by health system staff as a key barrier to providing high-quality health care during, for instance, supervision visits or workshops, this study aimed to assess if this constituted a barrier or promoting factor for the integration of ECD into routine maternal and child health services. When asked about providers' general willingness to work, the majority of HWs (89%) expressed they felt motivated at work (Figure 17).

Figure 17. Levels of HW motivation at work (n = 37).



When asked what in particular motivates them, most providers referred to the ECD component of the consultations. Examples of comments include:

*I feel motivated because I have already identified many children with nutrition problems, advised them, and in control visits they had improved.*

*I am very motivated but I need encouragement, creating opportunities for the health worker. All professionals should have training in ECD.*

*I feel motivated because the materials help as a guide to advise according to the age range and it has clear parameters.*

*I am motivated when I see changes in caregivers that they have complied with the recommendations of the health worker.*

*I feel good doing ECD counseling because a child who has had problems was in my hands and is now better because I gave my best, and this motivates me.*

*It has been very good. Thanks to ECD, we have been able to identify and treat many children with developmental problems.*

*Motivated because through the ECD it helps people to diagnose cases of malnutrition and diseases early.*

### **Objective 3: Assess the usability of PATH’s monitoring and counseling posters among facility-based HWs, and factors that influence their use.**

Observations included noting whether the PATH-provided tools were present in the consultation rooms. Table 12 summarizes the results for each tool.

Overall, materials were present during most consultations observed (greater than 79%). When present, the HW flipchart was most often found on top of the desk (88%), and the two posters (monitoring and stimulation) were most often found displayed in the consultation room (greater than 96%). Both the posters and the flipchart were found to be in good condition in virtually all consultation rooms.

Table 12. Presence, location, and condition of PATH ECD tools.

<b>Tool</b>	<b>Presence</b>	<b>Location</b>	<b>Status</b>
Health worker flipchart	n = 63	n = 49	n = 49
	Yes (79%) No (21%)	On top of desk (88%) Inside desk drawer (4%) With other documents (4%) In the washbasin (4%)	Good condition (98%) Poor condition (2%)
Poster of simplified monitoring of development	n = 63	n = 54	n = 54
	Yes (86%) No (14%)	Hanging on consultation room wall (96%) On top of desk (4%)	Good condition (100%) Poor condition (0%)
Poster of general stimulation activities	n = 63	n = 54	n = 54
	Yes (86%) No (14%)	Hanging on consultation room wall (98%) Behind other tool (2%)	Good condition (100%) Poor condition (0%)

Usability of PATH's monitoring and counseling posters by facility-based HWs was evaluated through cross-analysis of the findings obtained during observations, in-depth interviews, and self-administered questionnaires for HWs.

Table 13 summarizes the measurements for frequency of use of tools as reported individually by HWs. HWs interviewed (37) reported they often use or always use all three PATH tools (HW flipchart, poster of developmental milestones, and poster of general ECD stimulation activities). Most HWs explained that they used the tools frequently because they are easy to use and understand for both HWs and caregivers. However, these findings may need to be tempered based on observations reported earlier, when it was

noted that none of these tools were used in at least a quarter of consultations and the milestones poster was used more frequently than the other two tools.

Toys and games were occasionally used, but HWs reported they are either absent or lacking in quantity in many childcare entry points. HWs mentioned the importance of toys in detecting children with psycho-motor developmental delays and/or improving children’s motor development and communication. It is important to note that PATH has been promoting provider skills to produce simple toys from available materials, as opposed to promoting store-bought toys.

Table 13. Frequency and reasons for using PATH’s monitoring of development and counseling posters by facility-based HWs during a consultation for a child under 3 years of age (n = 37).

Tool	Frequency <sup>a</sup> (Median ± SD)	Major reasons for the frequency
HW flipchart	Frequently to always used (5.0 ± 0.72)	<ul style="list-style-type: none"> <li>• Easy to use and understand; use it always to explain and counsel caregivers.</li> <li>• Brings information about nutrition and how to play with children.</li> <li>• It is easy to use for counseling.</li> <li>• Explains better what to evaluate according to the child’s age.</li> <li>• Use the tool as reference for counseling.</li> </ul>
Poster of simplified monitoring of development	Frequently to always used (5.50 ± 0.85)	<ul style="list-style-type: none"> <li>• Guidance for age-specific monitoring.</li> <li>• Help HF-based HWs during the morning talks.</li> <li>• Easy to use and understandable by the caregivers.</li> <li>• It is a great job aid to identify ECD delays on child.</li> </ul>
Poster of general ECD stimulation activities	Always used (6.00 ± 1.33)	<ul style="list-style-type: none"> <li>• The poster design is excellent.</li> <li>• Easy to explain/teaching caregivers for stimulation activities on child-specific age.</li> </ul>
Games and toys	Occasionally used (4.00 ± 1.52)	<ul style="list-style-type: none"> <li>• Help on the detection of psycho-motor delays.</li> <li>• Stimulation of child motor and communication improvement.</li> <li>• Absence or not enough toys and materials.</li> </ul>

Abbreviations: ECD, early childhood development; HF, health facility; HW, health worker; SD, standard deviation.

<sup>a</sup>Linkert score: 1, never used; 2, very rarely used; 3, rarely used; 4, occasionally used; 5, frequently used; 6, always used.

Table 14 illustrates HWs’ (37) understanding and acceptance of PATH ECD tools. Overall, there seemed to be proper understanding of the aim of the HW flipchart, and the most used parts were the nutrition and stimulation counseling sections. The only suggested change to the HW flipchart was to add more details included in the other posters. Some HWs clearly understood the different aims of the Simplified Developmental Monitoring Poster and the ECD General Stimulation Activities Poster; however, several HWs saw these tools as interchangeable (expressing the view that the monitoring poster could be used for counseling and vice versa). HWs described they used parts of the Simplified ECD Monitoring Poster, depending on the age of child, and suggested that more milestones be added and the most important

milestones be highlighted. For the ECD General Stimulation Activities Poster, HWs said they used all of the depicted activities depending on the age of child, and they would not change anything in it.

Table 14. Understanding and acceptability of the content of PATH ECD tools (n = 37).

Tool	Question	Most frequent responses
HW flipchart	What is this material for and how should it be used?	<ul style="list-style-type: none"> <li>Serves to advise the caregiver and is used according to the age of the child.</li> <li>Helps in demonstrating to caregivers how to stimulate the child.</li> <li>Assists in counseling and diagnosis.</li> <li>Helps advise caregivers on good practices.</li> </ul>
	Which section of this material do you use most often during your ECD consultation?	<ul style="list-style-type: none"> <li>Breastfeeding/nutrition and stimulation.</li> <li>The section on the need for parents to monitor the child's development.</li> </ul>
	What are the aspects of the material you like?	<ul style="list-style-type: none"> <li>Nutrition.</li> <li>Stimulation.</li> <li>All sections.</li> </ul>
	What do you dislike?	<ul style="list-style-type: none"> <li>None; all sections are important.</li> </ul>
	What would you change in this material?	<ul style="list-style-type: none"> <li>Add more detail in this document in the posters.</li> <li>Nothing.</li> </ul>
Simplified ECD Monitoring Poster	What is this material for and how should it be used?	<ul style="list-style-type: none"> <li>Supports the counseling process.</li> <li>Facilitates stimulation and perception through illustrations.</li> <li>Helps assess child development.</li> <li>Assists in counseling caregivers to take care of their children.</li> </ul>
	Which section of this material do you use most often during your ECD consultation?	<ul style="list-style-type: none"> <li>All sections, depending on age.</li> </ul>
	What are the aspects of the material you like?	<ul style="list-style-type: none"> <li>All aspects, especially the part of the relationship between age and skills.</li> <li>All aspects.</li> </ul>
	What would you change in this material?	<ul style="list-style-type: none"> <li>Nothing.</li> <li>Add more elements in the poster.</li> <li>Differentiate the milestones that are more important.</li> </ul>

Tool	Question	Most frequent responses
ECD General Stimulation Activities Poster	What is this material for and how should it be used?	<ul style="list-style-type: none"> <li>Used to verify child development.</li> <li>Helps caregivers with stimulation.</li> <li>Helps in diagnosis of developmental delays.</li> </ul>
	Which section of this material do you use most often during your ECD consultation?	<ul style="list-style-type: none"> <li>All sections, depending on the child's age.</li> <li>From 3 to 18 months.</li> <li>The images because they have more impact when talking to caregivers.</li> </ul>
	What are the aspects of the material you like?	<ul style="list-style-type: none"> <li>Nothing specific was mentioned.</li> </ul>
	What would you change in this material?	<ul style="list-style-type: none"> <li>Nothing.</li> </ul>

Abbreviation: ECD, early childhood development.

Table 15 summarizes the usability of PATH's ECD tools, as self-reported by HWs. In general, the HWs agreed with regard to usability of the posters. HW opinions on the flipchart were explicitly not probed, given that the Mozambique MOH does not intend to replicate it for nationwide use. The results show that most HWs perceived both tools to be simple to use and helpful in monitoring and/or counseling activities.

Table 15. Opinions of HWs on usability of PATH ECD job aids (n = 37).

Statement	Simplified ECD Monitoring Poster (Median ± SD)	ECD General Stimulation Activities Poster (Median ± SD)
Total number of respondents	37	37
A. The poster is very complex. <sup>a</sup>	Disagree to strongly disagree <sup>b</sup> (2.00 ± 1.40)	Disagree (2.00 ± 1.4)
B. The figures on the poster are easy to understand.	Agree to strongly agree (4.00 ± 0.90)	Agree to strongly agree (4.00 ± 0.9)
C. The text on the poster is easy to understand.	Agree to strongly agree (4.00 ± 0.8)	Agree to strongly agree (4.00 ± 0.9)
D. Poster helps in identifying and referring children with developmental problems/helps in providing counseling.	Agree to strongly agree (4.00 ± 0.7)	Agree to strongly agree (4.00 ± 0.7)
E. Poster is easy to use.	Agree to strongly agree (4.00 ± 0.8)	Agree to strongly agree (4.0 ± 0.8)



Statement	Simplified ECD Monitoring Poster (Median ± SD)	ECD General Stimulation Activities Poster (Median ± SD)
F. All HWs can easily learn how to use the poster.	Agree to strongly agree (4.00 ± 0.8)	Agree to strongly agree (4.0 ± 0.6)
G. Degree of satisfaction with the poster. <sup>c</sup>	Not satisfied or unsatisfied (5.0 ± 1.0)	Not satisfied or unsatisfied (5.0 ± 0.4)
<b>Total score<sup>d</sup></b>	<b>(4.00 ± 0.20)</b>	<b>(4.25 ± 0.30)</b>
<b>Final agreement</b>	<b>Agree</b>	<b>Agree</b>

a. Lowest median value: HW interviewed rejected the hypothesis that the tools are very complex to be used on a routine basis.

b. Values for A through F: 1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree.

c. Values for G vary from 1 to 10: 1, very unsatisfied; 5, not unsatisfied or satisfied; 10, very satisfied.

d. Total score is only for concepts A through F, and not G.

#### **Objective 4: Assess the performance of facility-based HWs as it relates to following the updated MOH IMCI job aid (as it pertains to the ECD section); and identify factors that influence HW performance.**

During observations, the presence of the updated IMCI tool (that includes an ECD section) was recorded in the consultation rooms (Table 16). This tool was expected to be found in all the consultation rooms in which observations were conducted except for CCS (which mainly implements preventive services and not diagnostic and curative services), where consultation norms do not stipulate its use. Overall, the updated IMCI tool that includes an ECD section was not present during more than half (62%) of the relevant consultations observed. When present, the tool was most often found on top of the desk (100%) and in good condition.

Table 16. Presence, location, and condition of the IMCI tool in the relevant consultation room (CCD, CCR, CPP, pediatric ART).

Tool	Presence	Location	Status
IMCI job aid that includes ECD	n = 26	n = 21	n = 21
	Yes (38%) No (62%)	On top of desk (100%)	Good condition (100%) Poor condition (0%)

Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness.

Additionally, 45% of respondents reported they had not been trained or did not know this job aid. This may reflect gaps in government training processes, as the updated IMCI tool was rolled out by the Provincial Health Directorate (DPS) in October 2017. According to DPS the majority of staff trained during that period were outside of HFs, they are on license for their studies continuity. The staff covered by this study were relatively new, which could explain why they had not been trained on use of the IMCI tool.

HWs attending CCR, CCD, CPP, and pediatric ART consultation were interviewed about how often they used the ECD section in the updated IMCI handbook: never (50%), occasionally (7%), frequently (29%), and always (14%). Table 17 highlights frequency of and reasons for use of the IMCI tool, as reported individually by HWs.

Table 17. Frequency and reasons for use of the updated IMCI tool ECD section by facility-based HWs during consultations for children under 3 years (n = 14).

Tool	Frequency <sup>a</sup> (Median ± SD)	Factors that affected frequency of use
IMCI tool (that includes ECD)	Rarely used (3.5 ± 2.12)	<ul style="list-style-type: none"> <li>• The staff was not trained to use the tool.</li> <li>• It is helpful in detecting child illnesses.</li> <li>• Helps to treat child illnesses according to IMCI.</li> <li>• Helps to evaluate the type of disease, such as child growth.</li> </ul>

Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness; SD, standard deviation.  
<sup>a</sup>Linkert score: 1=never used; 2=very rarely used; 3=rarely used; 4=occasionally used; 5=frequently used and 6=always used

Table 18 summarizes the usability of the ECD section of the updated IMCI tool, as self-reported by HWs familiar with the section (n=17). In general, the HWs found the ECD section in the IMCI tool somewhat complex, but still easy to understand and use.

Table 18. HW opinions on usability of the IMCI tool ECD section.

Sentence/category	(Median ± SD)
Total number of respondents	17 <sup>a</sup>
A. Using the ECD section in the IMCI tool is too complex. <sup>b</sup>	Agree <sup>c</sup> (3.00 ± 1.0)
B. The figures in the ECD section in the IMCI tool are easy to understand.	Agree (4.00 ± 0.9)
C. The text in the ECD section in the IMCI tool is easy to understand.	Agree (4.00 ± 0.9)
D. The ECD section helps in identifying and referring children with developmental problems.	Agree (4.00 ± 0.5)
E. The ECD section in the tool is easy to use.	Agree (4.00 ± 0.4)
F. All HWs can easily learn how to use the ECD section in the IMCI tool.	Agree (4.00 ± 0.7)
G. Degree of satisfaction with the ECD section in the IMCI tool. <sup>d</sup>	Unsatisfied (4.00 ± 1.2)
<b>Total score<sup>e</sup></b>	<b>Agree (4.00 ± 0.30)</b>
<b>Final agreement</b>	<b>Agree</b>

Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness; SD, standard deviation.

a. N is 17 because this tool is used only in CCD, CCR, CPP, and pediatric ART consultation, and 17 HWs participated as respondents.

- b. Lowest median value: HW interviewed rejected the hypothesis that the tools are very complex to be used on a routine basis.
- c. Values for A through F: 1, strongly disagree; 2, disagree; 3, neither agree nor disagree; 4, agree; 5, strongly agree.
- d. Values for G vary from 1 to 10 (1, very unsatisfied; 5, not unsatisfied or satisfied; 10, very satisfied).
- e. Total score is only for concepts A through F, and not G.

Table 19 illustrates HWs' (n=14) understanding and acceptability of the ECD section of the IMCI tool. As noted earlier, most respondents who were supposed to use this tool had not been trained nor knew this job aid. Others responded with the complete IMCI tool in mind versus just focusing on the ECD section, as they observed several subsections to be difficult to understand, such as the treatment of respiratory problems. Some respondents demonstrated lack of understanding of the actual purpose of the tool (e.g., "It has to do with pediatric ART").

Table 19. Knowledge and acceptability of the contents of the ECD section of the IMCI tool recently updated by the MOH (n = 14).

Material	Question	Most frequent responses (n=14)
ECD section of updated IMCI tool	What is this material for and how should it be used?	<ul style="list-style-type: none"> <li>• Assess child development.</li> <li>• Helps to pay attention in the child.</li> <li>• Did not have training.</li> <li>• Helps on consultation and drug prescription.</li> </ul>
	Which section of this material do you use most often during your ECD consultations?	<ul style="list-style-type: none"> <li>• Use according to the child's diagnosis.</li> <li>• Did not have training.</li> <li>• Do not know.</li> </ul>
	What are the aspects of the material you like?	<ul style="list-style-type: none"> <li>• In the part of medication because everything is calculated.</li> <li>• Did not have training.</li> <li>• Do not know.</li> </ul>
	What do you dislike?	<ul style="list-style-type: none"> <li>• Nothing.</li> <li>• Part of the treatment of cough and breathing difficulties.</li> <li>• Do not know the material.</li> </ul>
	What would you change in this material?	<ul style="list-style-type: none"> <li>• I would change the part on how to treat the cough.</li> <li>• Do not use.</li> </ul>

Abbreviations: ECD, early childhood development; IMCI, Integrated Management of Childhood Illness.

## **Objective 5 [secondary objective]: Assess caregivers' ability to recall key ECD messages and their intention to act after being exposed to ECD counseling in a HF.**

Among the caregivers interviewed for the first time, 59% said that they had not received any counseling on how to be responsive, or how to play or talk with their child (Table 20).

Those who were counseled most frequently received the message about playing with the child. Counseling on talking with the child was reported by only half of caregivers who were counseled. Since talking with the child is an activity associated with many benefits for children’s cognitive and language development, this counseling will need to be reinforced.

When asked about specific practices the provider taught them, almost every third caregiver responded that HWs had directed them to make toys for their children, and almost every fifth caregiver mentioned being taught to do a specific activity with the child. PATH has been emphasizing the need for demonstration of play activities in consultations catering to children at risk (CCR, pediatric HIV); since very few observations were conducted in these consultations, further study is needed to find out whether providers in these consultations are actually more likely to teach play activities to caregivers.

Table 20. Numeric distribution of caregivers’ responses to general and specific recommendations provided by HWs (n = 237 caregivers).

District	Number of caregivers	In general, the health worker talked about...			Specifically, the health worker taught me to...					
		A	B	C	1	2	3	4	5	6
Moamba	27	12	14	3	11	7	5	6	1	12
Namaacha	44	26	15	5	13	10	5	5	0	29
Matutuine	27	13	7	9	15	5	6	5	2	10
Marracuene	56	38	10	8	8	6	7	0	3	37
Manhiça	39	18	10	8	13	7	8	9	0	21
Magude	44	33	7	1	6	8	3	2	0	33
<b>Total</b>	<b>237</b>	<b>140 (59%)</b>	<b>63 (27%)</b>	<b>34 (14%)</b>	<b>66 (28%)</b>	<b>43 (18%)</b>	<b>34 (14%)</b>	<b>27 (11%)</b>	<b>6 (3%)</b>	<b>142 (60%)</b>

A = They did not tell me how to talk or play with my child; B = Playing games/playing with my child; C = Talking with my child.  
 1 = Make a toy for my child; 2 = Do a specific play activity or talk with my child; 3 = Play/talk with my child during daily routines and household chores; 4 = Praise my child; 5 = Others; 6 = No response.

a. The sum of percentages is not 100 because the percentage of each response was calculated individually, to understand which was more reminded by the caregivers.

Examples of the most prevalent messages given by HWs to caregivers about how to take care of their child (n=237):

*HW talked about how to feed correctly the child.*

*HW talked about breastfeeding and nutrition.*

*HW talked about bringing the child to the HF for vaccination and when is sick.*

*HW talked about the need to play with the child.*

*HW talked about the need to keep the child clean.*

HW talked about the need to use mosquito net for child during the sleep time.

HW talked about how to medicate the child.

Of the caregivers who received recommendations to play and/or talk with their child, the majority (90%) felt sure they could follow the recommendations; only a few were unsure. Table 21 provides examples of the reasons caregivers provided for feeling sure or not sure about their ability to follow recommendations.

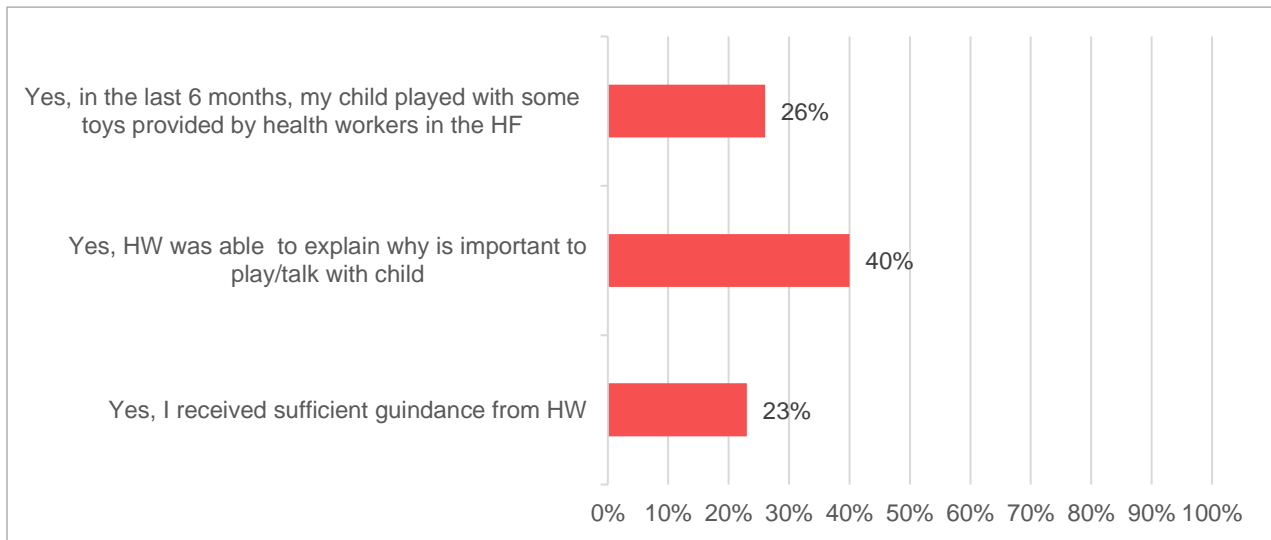
Table 21. Caregivers' intention to follow recommendations and main reasons (n = 237).

Intention	Main reasons
Felt sure or very sure of ability to follow recommendations (n = 86)	<i>I will follow the recommendation because I want to see my child growing well.</i> <i>It is easy to follow the recommendations, as it is something that I am always doing [referring to play with child].</i> <i>I have enough time to play and take care of my child.</i> <i>I have to do everything for my child.</i> <i>Because I have to know that if I don't take care of the child, I am harming the child.</i> <i>I will follow because when the child has toys, we can discover birth defects.</i>
Felt unsure or stated unable to follow recommendations (n = 9)	<i>I don't have enough time to play with child because of work.</i> <i>I don't know how to make toys.</i> <i>Yes, although it is not easy, because the child has visual difficulties.</i> <i>The lack of financial condition makes it difficult.</i>

Only 26% of caregivers in the first interview responded that in the last 6 months their children had played with toys provided by a HW in a HF while in the waiting room.

With regard to caregiver satisfaction with the HW guidance about how to stimulate the child, only 23% responded that they had received sufficient guidance from the HW. However, 40% of caregivers stated that the HW was able to explain why it is important to play and talk with the child (Figure 18).

Figure 18. Percentage distribution of caregiver satisfaction with HW's guidance, explanation on importance of play/talk, and availability of toys for children in the waiting room (n = 237).



Abbreviations: HF, health facility; HW, health worker.

Of the 133 caregivers who attended the second interview (23 to 30 days after the first interview), 52% did not respond when questioned if they remembered the key messages provided by HWs at the last HF visit. Of those who did not respond, 30% reported to have not received counseling on playing or talking with their child on the first interview (Figure 19). Therefore, 70% of those who did not remember the guidance were actually counseled. This suggests there is a need to re-think the quality of counseling. Experience in other countries, such as Bangladesh, where recall of facility counseling was high when coupled with take-home materials for at-risk children, may be relevant here.<sup>9</sup>

Figure 19. Percentage of caregivers who did not respond on the second interview and that had either reported to have received counseling on the first interview or to not have received counseling on the first interview (n=69).

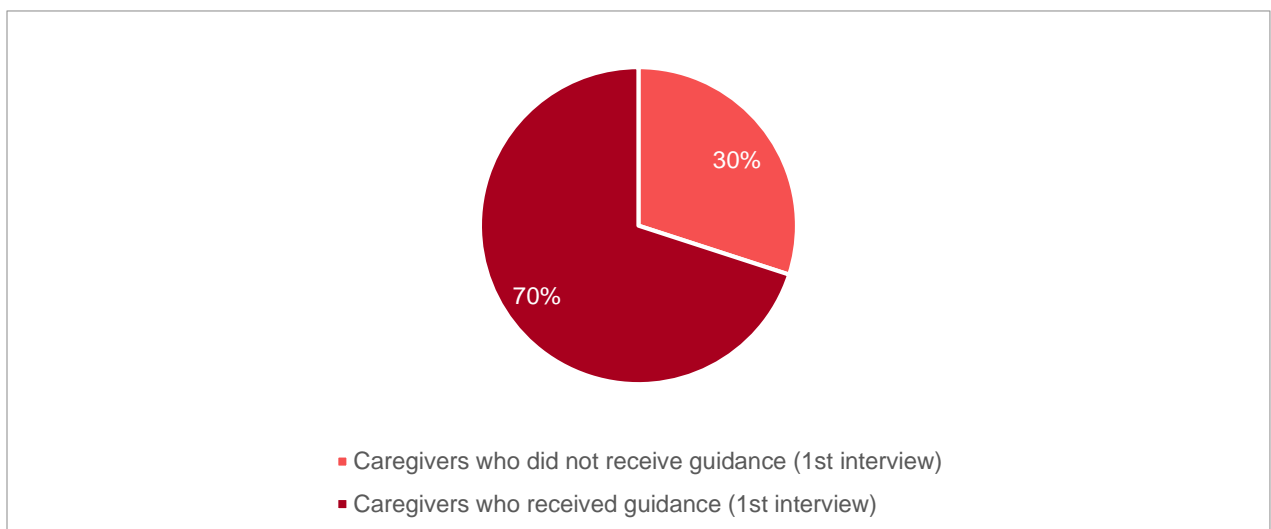


Table 22 provides the frequency of ECD messages remembered by caregivers one month after the first consultation. More than half of caregivers (52%) did not answer the question, but of the caregivers who did answer, the most recalled message was 'make toys for the baby,' (number 1 in the table), followed by message 3 ('play and talk with my child'), and message 2 ('do a specific activity').

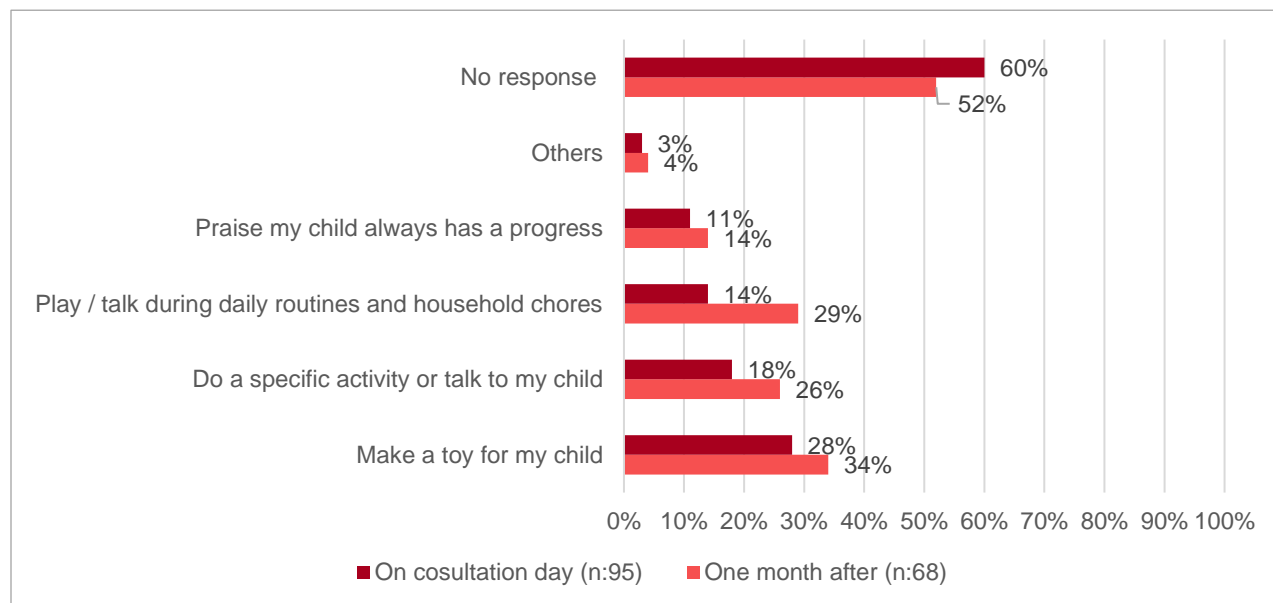
Table 22. Messages remembered by caregivers one month later (n = 133).

District	Number of caregivers	Specifically, the health worker taught me to...					
		1	2	3	4	5	6
Moamba	18	8	6	4	2	3	6
Namaacha	26	10	9	6	4	0	15
Matutuine	24	9	4	9	3	0	12
Marracuene	17	5	4	9	1	0	8
Manhiça	26	12	9	8	7	1	12
Magude	22	1	2	3	1	1	16
<b>Total</b>	<b>133</b>	<b>45</b>	<b>34</b>	<b>39</b>	<b>18</b>	<b>5</b>	<b>69</b>
<b>Percentage</b>	<b>100%</b>	<b>34%</b>	<b>26%</b>	<b>29%</b>	<b>14%</b>	<b>4%</b>	<b>52%</b>

1 = Make a toy for my child; 2 = Do a specific play activity or talk with my child; 3 = Play/talk with my child during daily routines and household chores; 4 = Praise my child; 5 = Others; 6 = No response.

Figure 20 represents the comparison of ECD messages recalled by caregivers during the first and second interviews. Overall, the results suggest that the recall of ECD-specific messages after one month continued to be strong and actually improved across the board.

Figure 20. Messages remembered by caregivers during the first and second interviews.



When discussing easier ways to remember and follow recommendations, the majority of caregivers (73%) said they did not have any opinion. Others shared the following suggestions:

*The HW needs to use more simplified terms, to facilitate understanding.*

*The HW needs to give more examples for better understanding.*

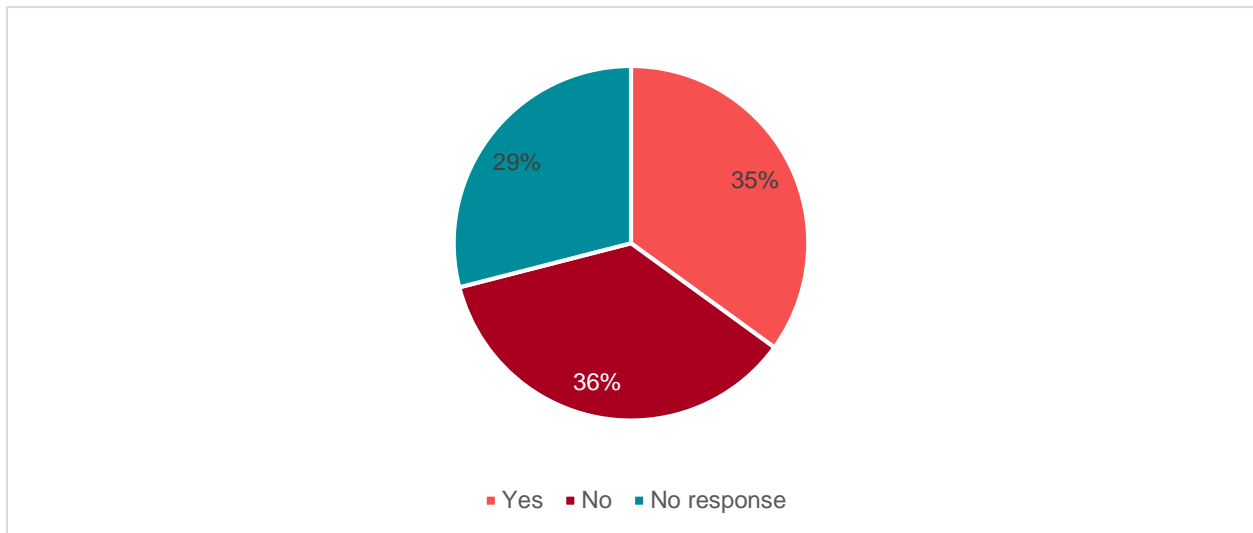
*The HW needs to explain it always during the consultation or morning talks.*

*The HW needs to have more patience to explain the caregiver.*

With regard to nutrition messages and guidance, only 35% of caregivers responded during the first interview that the HW had provided enough guidance on how to feed their child, while 36% responded that the HW did not provide enough guidance on how to feed the child (Figure 21 below).

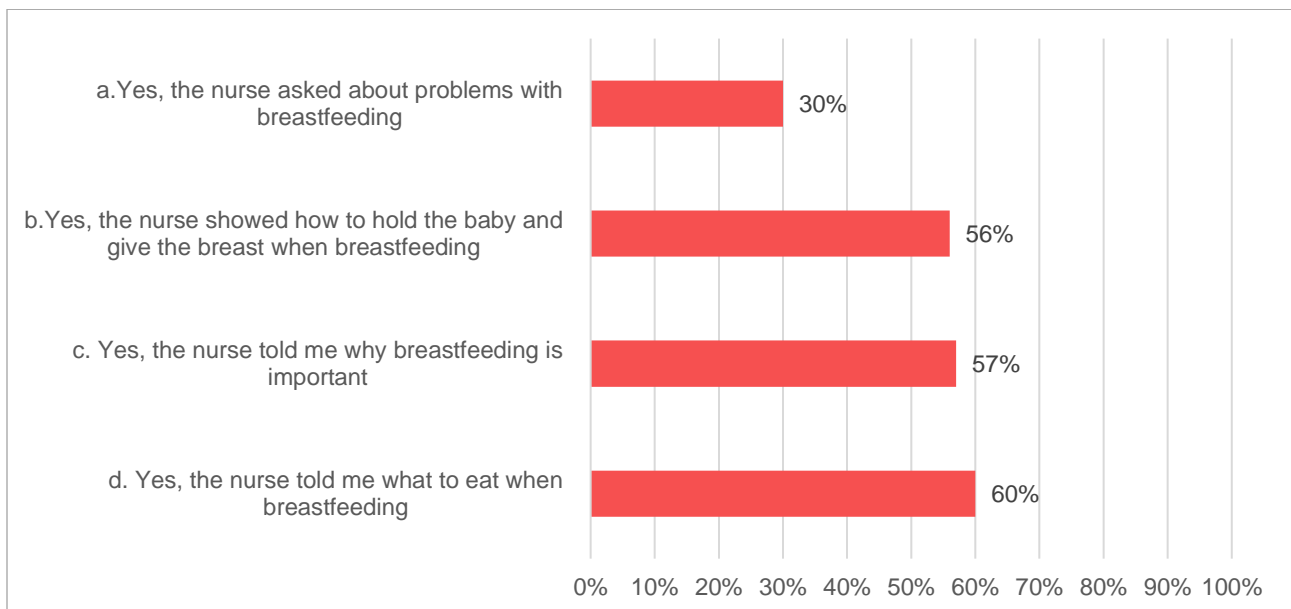


Figure 21. Proportion of caregivers who stated that HWs provided enough guidance on how to feed their child (n = 237).



With regard specifically to breastfeeding messages provided by HWs during the consultation, more than half of respondents with children aged 0 to 6 months stated in the first interview that HWs demonstrated a good breastfeeding position and attachment and explained the importance of breastfeeding and what a breastfeeding woman should eat (Figure 22). However, only 30% of caregivers of children under 6 months mentioned discussing breastfeeding problems with the nurse.

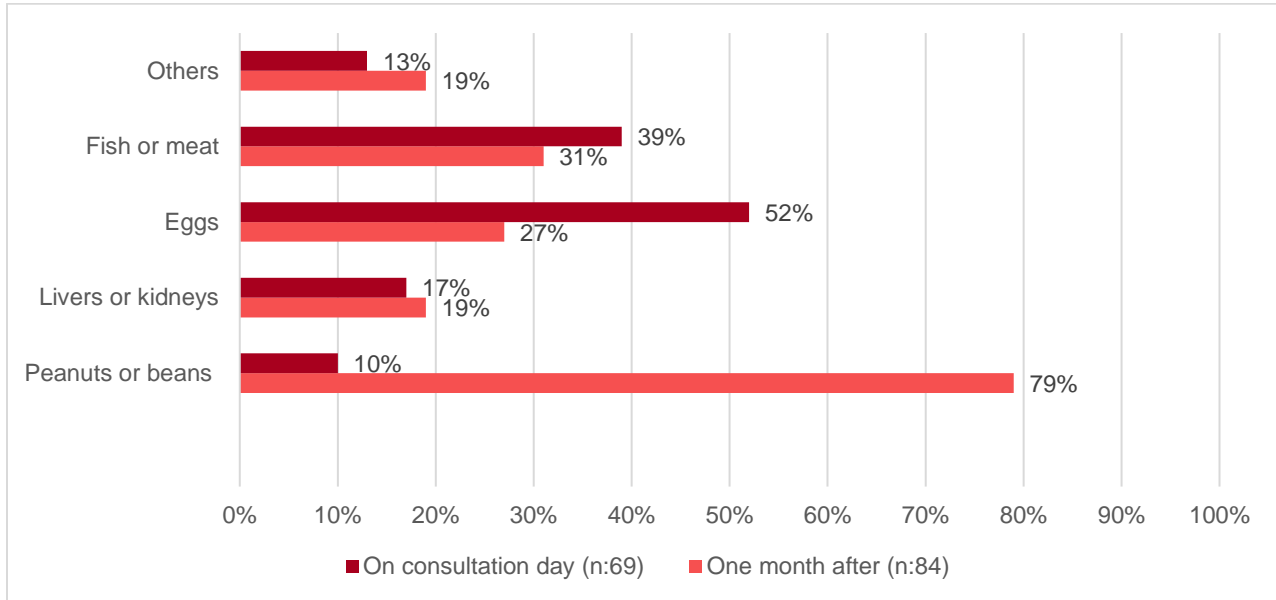
Figure 22. Responses of caregivers of children under 6 months about nutrition messages given by HWs during the counseling session (first interview, n = 155).



As shown in Figure 23 below, when asked about the food the provider mentioned would help the baby grow, most caregivers in the first interview mentioned “eggs” (52%), followed by “fish or meat” (39%); in the

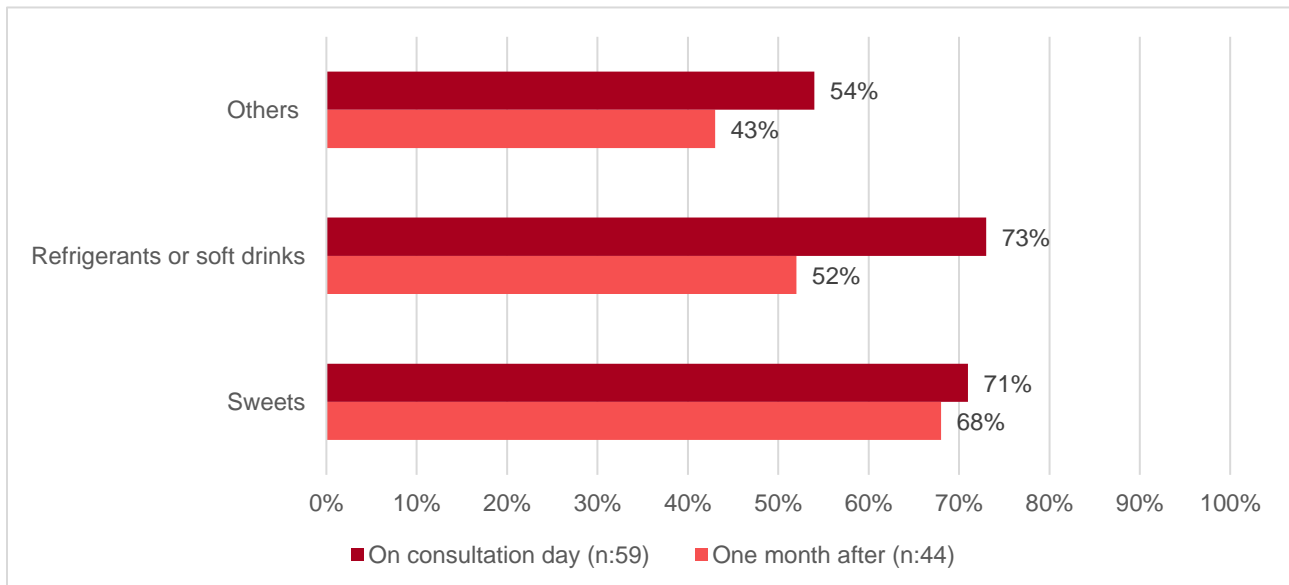
second interview, the most recalled food was “peanuts/beans” (79%), followed by “fish or meat” (31%). It is possible this recall was influenced by the availability of specific foods in the home.

Figure 23. Messages given by HWs to caregivers: Which foods did the nurse tell you help your baby grow?



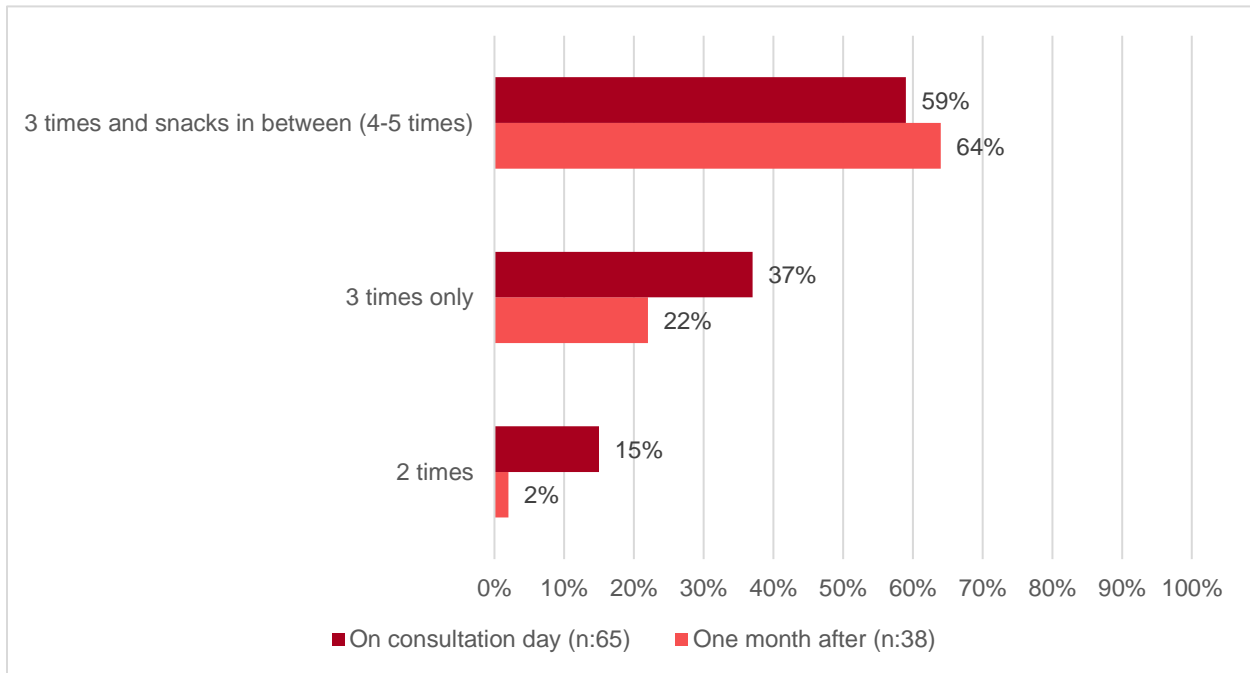
With regard to foods HWs told caregivers were not good for children (Figure 24), most caregivers recalled “soft drinks” (73%), followed by “sweets” (71%). In the second interview, recall was still strong, with most recalling “sweets” (68%), followed by “soft drinks” (52%).

Figure 24. Messages given by HWs to caregivers: Which foods did the nurse tell you are not good for children (non-nutritious foods)?



With regard to the frequency of meals for the baby (Figure 25), most caregivers (59% and 64%, at the first and second interview, respectively) remembered correctly they should feed their child “three times and give them snacks in between.” In summary, the recall of ECD and nutrition messages was strong after one month and improved in several cases.

Figure 25. Messages given by HWs to caregivers: According to what the nurse told you, how many times should your baby eat?



---

## Discussion

This discussion summarizes and interprets the results of the study and is structured around the main objectives of the study.

### **Objective 1: Document trends in ECD monitoring and referral to specialists since the integration of PATH's ECD monitoring and counseling materials in 2015 in Maputo Province.**

The analysis of trend points suggests a trend toward an increased number of children reported to have been monitored for delays from May 2016 to December 2018. As per HF registers, on average, 77% of children coming for maternal and child health consultations were monitored for developmental delays, with some variability by district. This is similar to the frequency of developmental monitoring that was observed during consultations (72%). However, only 30% of HWs said they conducted developmental monitoring more than 70% of the time, which could suggest that the way the registers are currently being filled out does not necessarily reflect whether the activity is actually taking place. Additionally, only 24% of HWs (of those who responded when asked what they considered when completing the ECD column in the HF registry) said they were referring to developmental milestones of the child (as opposed to anthropometric measurements) when writing ECD in the "Observations" column, which could suggest again that the entries in the register do not necessarily indicate that developmental monitoring took place.

Another trend seems to be an increase in the number of children who were seen at physiotherapy services in the same period of time (from May 2016 to December 2018). Likewise, 87% of HWs mentioned they had been identifying more children with developmental delays and referring more children since PATH's tools were introduced in HFs in Maputo. This was corroborated by physiotherapists interviewed, who most often said they had noticed an increase in the number of referrals since the beginning of the project. However, given the design of this study, the lack of data from before the PATH intervention began, and the inability to determine if ECD data in HF registers are reliable, it is not possible to attribute this trend solely to PATH's intervention.

Despite the increase in referral trends, only 0.4% of monitored children were identified with suspected delay, which is lower than what would be expected based on prevalence of disabilities in children 0 to 4 years (0.8% according to the 2017 census<sup>4</sup>) and acute malnutrition (2% in Maputo Province, according to the 2011 Demographic and Health Survey<sup>6</sup>). This low detection rate could be the result of the relatively limited developmental monitoring, but could also be linked with the most frequently used monitoring tool (the milestones poster), which has low sensitivity for detection of delays compared with more comprehensive screening and assessment tools.<sup>10</sup>

## **Objective 2: Assess the performance of facility-based HWs as it relates to following the monitoring and counseling approach outlined in the PATH HW flipchart and HW use of PATH’s monitoring and stimulation posters; and identify factors that influence HW performance.**

The majority (59%) of observation of consultations took place in CCS, which included some component of ECD lasting 12 minutes on average, but the longest consultations tended to be pediatric ART (average 20 minutes; n = 2) and the shortest CCS (average 11 minutes). These numbers were similar to what HWs reported themselves, since they said they spent, on average, 12 minutes on a consultation, with the longest average at CCD (19 minutes) and the shortest average at CCS (9 minutes). When asked how much time they would actually need to complete a consultation, the HWs perceived needing double the time they currently spend (23 minutes versus 12 minutes).

The time observed to be spent on developmental monitoring in all consultations was 4 minutes on average, and time spent on counseling (not exclusive of ECD) was 6.5 minutes. These data suggest that monitoring should be structured so it can be completed in less than 5 minutes for it to realistically take place within this context, with a need to optimize how monitoring is done during such allotted time and ensuring there is enough time left to conduct counseling. Given that CCS is currently the shortest consultation, and the one attended by the greatest number of children under 3 years of age and their caregivers, there may be more flexibility in CCS to allow adequate time to conduct ECD monitoring and counseling. On the other hand, almost half of HWs interviewed thought that ECD monitoring and counseling should take place in all consultations, but then a third of them stated that CCS was the best platform given that it is “the gateway to all children.”

Findings from observations and HW interviews suggest that not all basic anthropometric measurements are being taken, despite the training and mentoring provided by the government and PATH. Of the four anthropometric measures, weight was the most consistently checked (in 82% of observed consultations). Falling below growth standards for any of the anthropometric indicators is associated with developmental delays, and full assessment as part of routine child health checks is recommended in the MOH guidelines and is reinforced in PATH-developed job aids.

It was observed that HWs performed monitoring of developmental milestones in 72% of consultations. In contrast, only 30% of HWs said they conducted ECD monitoring more than 70% of consultations, and another 54% said they conducted it between 30% -70% of consultations. The higher percentage in observations could possibly be explained by the fact that HWs knew they were being observed for ECD, so they felt pressured to conduct developmental monitoring. When asked, those HWs who reported not performing monitoring of milestones systematically, explained this was due to high patient volumes or in cases in which they did not detect any risk factors. These comments highlight the common problem of limited human resources in HFs, and the need for refresher training on MOH consultation norms, which stipulate that developmental monitoring must be done even if risk factors are not present.

In most consultations observed, the HW asked the caregiver about milestones and did not verify directly when checking the child. Although adherence to norms in all consultations requires direct observation, this may be a difficult requirement in CCS and CCD due to the high volume of clients and other priorities. Working with the MOH to make the norms more feasible for implementation—for example, designating certain age ranges at which to carry out developmental monitoring—may be necessary to ensure this service is performed at the level of quality desired.

Similar to what HWs shared regarding their developmental monitoring activities, only 35% said they conducted ECD counseling more than 70% of consultations. HWs expressed that in order to conduct monitoring and counseling more frequently and easily, they needed (a) more staff trained in ECD and available to provide talks to caregivers; (b) staff allocated to specifically provide counseling; (c) space in CCS for conducting developmental monitoring and counseling; and (d) the ECD component to be integrated into HF registers. While some of the aspects are structural in nature, the MOH recently began to roll out new child health registers that integrate ECD indicators, which should help institutionalize developmental monitoring and counseling.

### **Objective 3: Assess the usability of PATH’s monitoring and counseling posters among facility-based HWs, and factors that influence their use.**

It was confirmed that in the majority of observed consultations (79% to 86%), different PATH materials were available in the consultation room, most visible hanging on a wall or on the desk. It was also observed that the tools were being used—in 76% of consultations in which developmental monitoring was observed to actually take place. The most frequently used tool was the ECD Simplified Developmental Monitoring Poster for monitoring of development activities, used in 60% of observations, and the HW flipchart for counseling, used in 51% of observed counseling sessions.

In terms of the counseling portion of the consultation, in more than a third of consultations, the HW did not use any tool for counseling. In instances in which a tool was used during counseling, the HW showed the tool to the caregiver in half of the consultations observed, but in about 20% of observations, the HW did not engage with the tool with enough attention. These findings suggest that most of the materials that were distributed at the beginning of the PATH intervention are still present and in use, although not always utilized by HWs as would be ideal.

PATH’s HW flipchart is not discussed here, as the Mozambique MOH has decided to not replicate that material. In terms of the two posters, HWs expressed that they used them frequently because they were a “great job aid” and “poster design is excellent.” Overall, HWs had a good understanding of the aim of the posters and how to use them, and they found them adequate as is, for the most part. The usability scores also indicated the posters were easy to use and understand and that HWs considered others would find them easy to learn how to use. HWs felt the PATH tools helped them identify developmental delays, *“because it is through the material that I can identify at what age the child should do what.”* These findings are encouraging and suggest that from a usability point of view, posters are adequate in their current format. It was suggested that the Simplified ECD Monitoring Poster could be improved by highlighting the milestones that are most important to check.

### **Objective 4: Assess the performance of facility-based HWs as it relates to following the updated MOH IMCI job aid (as it pertains to the ECD section); and identify factors that influence HW performance.**

The updated IMCI tool that includes an ECD section was not present in more than half (62%) of consultation rooms observed, where it should have been found (CCD, CCR, and pediatric ART consultation). The usability scores for this tool indicated that HWs occasionally or never used the ECD section, and that they found it somewhat complex, even when they could understand the content and found it easy to use. Some of the responses from HWs suggest they were thinking of the complete IMCI tool and not really focusing their comments on the ECD section when responding. Moreover, 45% of HWs said they did not know the

tool or had not been trained on it. This limited the experiences HWs could share about use of the tool. While PATH has been promoting use of the IMCI tool in relevant consultations as a way to improve developmental monitoring and counseling, the complexity of the tool and the slow rollout in HFs has impeded its use. In the trainings since the study, PATH has opted to provide copies of the relevant IMCI sections to providers, to ensure that, at minimum, they have and know the sections pertaining to ECD.

## **Objective 5 [secondary objective]: Assess caregivers' ability to recall key ECD messages and their intention to act after being exposed to ECD counseling in a HF.**

More than half of caregivers (59%) exiting a consultation and interviewed for the first time said they had not received any information or guidance on how to responsively care for, play with, or talk with their child. A lower percentage (36%) said they did not receive enough guidance on how to feed their child. Since recall is not expected to be an issue when coming immediately from a consultation, this would suggest once more that ECD counseling is only happening in a third of consultations, which corresponds with what HWs themselves said during the interviews.

Of those caregivers who did receive the recommendations on play, the majority (90%) felt sure they would be able to follow them, suggesting that caregivers themselves are unlikely to be a barrier to ECD practices being used at home. The few caregivers who said they did not feel sure they could follow the recommendations alluded to lack of time and financial constraints.

The most commonly recalled messages were related to the importance of play and to playing and making toys for the child. Reinforcing talking or responsive care for the child, as well as actually engaging caregivers in desired practices, was less common.

Caregiver responses also suggest that the playbox sessions during HF wait times are not happening regularly, as only 26% said they or their children had contact with toys in the waiting room in the six months prior to the interview. This reflects the challenge of making the playbox sessions an integral part of HF visits, as they are not currently a part of any government service or guidelines, and so implementation depends primarily on PATH's support.

In the follow-up interview, more than half (52%) of caregivers did not respond when asked about stimulation messages they had received the month before, in spite of being shown the poster with the messages to choose from. Beyond inability to recall, this is partly explained by the fact that 30% of these caregivers had not received guidance during the consultation a month before. Similarly, when asked about nutrition messages, the majority of respondents (78%) said they had not received such messages the month prior.

On a positive note, data indicated improved recall among the caregivers who did recall stimulation and nutrition messages, and most were able to share correct messages about play, and nutritious and non-nutritious foods and frequency of meals for the children. This suggests that caregivers who actually received counseling, were counseled adequately.

---

## Conclusion and recommendations

This study suggests that integration of developmental monitoring and counseling into routine HF services by HWs in Maputo Province is taking place but it is happening partially. Direct observations during consultations and interviews with HWs and caregivers convey that effective integration of these activities takes place in roughly a third of consultations. This conclusion is limited by the fact that the study was conducted within a restricted period of time. At the same time, the physiotherapy register data suggest that more children with developmental delays are being referred to specialists; and health workers have a positive perception of PATH materials, have confidence in their own ability to detect delays, and agree with the need to conduct monitoring and counseling in most maternal and child health consultations.

The study also suggests that several systemic barriers may be preventing HWs from fully integrating developmental monitoring and counseling into routine consultations. The following recommendations have been developed to improve performance:

1. Use of monitoring and stimulation posters should be continued; however, there may be a need for a targeted tool/checklist that will remind and prompt HWs to conduct developmental monitoring and counseling. Such a tool could be used by any HW (including community health volunteers) and even by caregivers, so they know what should happen in a consultation. Such a tool does not need to be solely focused on ECD but can integrate reminders of other important activities to be done as a part of the consultation.
2. The intervention should be structured in such a way that allows for monitoring to be completed in less than 5 minutes and counseling in an additional 5 minutes, integrating both nutrition and child stimulation messages. The guidance should be adapted to the consultation norms, which may need to specify ages for developmental monitoring, which tool to use, etc.
3. To increase coverage of the intervention, there is a need to develop a strategy on the type of consultations that might be more feasible for delivering the intervention. At the same time, this needs to be aligned with current MOH guidelines, which expect developmental monitoring to be part of every type of child consultation. Perhaps a feasible strategy would be to promote a less intensive approach to developmental monitoring and counseling in some consultations, which, like CCS and CCD, have a very high volume of clients, and a more intensive approach (with more detailed observation and counseling on ECD) in other consultations that cater to smaller groups of children but who are at higher risk of developing delays (CCR, pediatric ART, etc.). Finally, experiences of other countries could be considered, for example, those of South Africa, in selecting specific age groups for developmental monitoring as opposed to conducting monitoring of all children.
4. Addressing facilitators such as dedicated staff and allocated space and time to perform monitoring and counseling might be one strategy to consider.
5. If developmental monitoring and counseling is to be conducted as part of CCD, CCR, and pediatric ART consultation, HWs need to be systematically informed about the ECD section of the IMCI tool and receive training on its use. Support for the reproduction of the actual IMCI tool may also be necessary.
6. As already mentioned, the MOH recently integrated developmental monitoring indicators into CCS and CCD registers. However, first implementation results suggest that ongoing training, mentoring, and supervision are needed to ensure HWs know how to properly complete these indicators. Integrating ECD content into national maternal and child health and nutrition supervision guides and having the



MOH provide targets for detection of developmental delays (like it does with many other services) may be important to improve ECD data collection and quality across the country.

7. Supervision of developmental monitoring and counseling should include discussing openly with HWs the barriers to implementation, highlighting the impact of intervention, and checking the quality of data recorded in the registers.
8. Developmental monitoring and counseling should be included in pre-service training for HWs. This would provide more time for training and would hopefully increase the number of HWs systematically conducting these activities as a part of routine consultations.
9. To increase key message recall, additional components need to be integrated, such as ensuring that messages provided are relevant for the age and developmental stage of the child and that they address behavioral determinants that may impede or promote change; improving interpersonal communication skills; providing take-home materials; and improving use of behavior modeling techniques and toys during counseling.
10. A stronger enabling policy environment may be needed to support more robust implementation. While new CCS and CCD registers, which integrate an ECD indicator, were introduced at the end of 2018, and CCS and CCR clinical norms are currently being revised to align with the new registers, the MOH may need to issue directives to the provinces to promote adequate data collection and analysis of this indicator at the local level, including setting targets for detection of developmental delays based on prevalence of disabilities, acute malnutrition, and other key risk factors; and ensuring that data trends are being monitored at all levels and feedback is provided to inform decision-making.

---

## References

1. Black MM, Walker SP, Fernald LCH, et al. Early childhood development coming of age: science through the life course. *The Lancet*. 2017;389(10064):77–90. [https://doi.org/10.1016/S0140-6736\(16\)31389-7](https://doi.org/10.1016/S0140-6736(16)31389-7).
2. Britto PR, Lye SJ, Proulx K, et al. Nurturing care: promoting early childhood development. *The Lancet*. 2017;389(10064):91–102. [https://doi.org/10.1016/S0140-6736\(16\)31390-3](https://doi.org/10.1016/S0140-6736(16)31390-3).
3. Richter LM, Daelmans B, Lombardi J, et al. Investing in the foundation of sustainable development: pathways to scale up for early childhood development. *The Lancet*. 2017;389(10064):103–118. [https://doi.org/10.1016/S0140-6736\(16\)31698-1](https://doi.org/10.1016/S0140-6736(16)31698-1).
4. Instituto Nacional de Estatística. *IV Recenseamento geral da Populacao e habitação: Resultados Definitivos*. Moçambique, Maputo, INE; 2019.
5. World Bank website. GNI per capita, PPP (current international \$) page. <https://data.worldbank.org/indicator/ny.gnp.pcap.pp.cd>. Accessed June 23, 2019.
6. Ministerio da Saúde (MISA/Moçambique), Instituto Nacional de Estatística (INE/Moçambique), ICF International. *Moçambique Inquérito Demográfico e de Saúde 2011*. Calverton, Maryland, USA: MISA/Moçambique, INE/Moçambique, and ICF International; 2013. <https://dhsprogram.com/pubs/pdf/FR266/FR266.pdf>.
7. Early Childhood Development Action Network website. Mozambique: Early childhood development [country profile]. <https://www.ecdan.org/mozambique.html>.
8. Couper J. Prevalence of childhood disability in rural KwaZulu Natal. *South African Medical Journal*. 2002;92 (7):549–552.
9. Chinen M, Bos JM. Impact Evaluation of the Save the Children Early Childhood Stimulation Program in Bangladesh: Final Report. American Institutes for Research. 2016
10. American Academy of Pediatrics. Identifying Infants and Young Children With Developmental Disorders in the Medical Home: An Algorithm for Developmental Surveillance and Screening. *Pediatrics* 2006; 118, 405. Doi:10.1542/peds.2006-1231.