

# CARE FOR CHILD DEVELOPMENT (C4CD) PLUS

A PILOT PROJECT FOR 3-5 YEAR OLD CHILDREN



## IMPACT EVALUATION REPORT

NOVEMBER 2017



**Department of Public Health**  
Ministry of Health



**Save the Children**  
Bhutan Country Office



Care for Child Development Plus

# C4CD Plus

PILOT PROJECT

For 3-5 Year-Old Children

## Impact Evaluation Report

November 2017



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Bhutan Country Office

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- Save the Children Bhutan Country office,Thimphu, 2017

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ཐིམ་ཕུ་

ROYAL GOVERNMENT OF BHUTAN  
MINISTRY OF HEALTH  
Secretary's office  
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SECRETARY

## Foreword

The Royal Government of Bhutan (RGOB) recognizes the important role of Early Childhood Care and Development (ECCD) programs in promoting the holistic advancement of a child's physical, cognitive, social and emotional development. The concerted efforts of the Ministry of Education (MOE) and other actors have resulted in expanding comprehensive ECCD services in the country in a short period of time. Despite this progress, reaching remote communities in the mountainous terrain has been difficult and challenges the equitable expansion of center based ECCD services throughout the country.

Given the constraints on establishing ECCD centers in the most sparsely populated areas of the country, and in recognition of the importance of holistic child development, the Ministry of Health (MOH) partnered with Save the Children (SC) to implement an innovative parenting program known as "Care for Child Development Program (C4CD) Plus". The program aims to empower parents and caregivers of 3-5 years-old children with the skills to engage children in early literacy and math activities, enhance responsive caregiving, and practice better health and nutrition routines through monthly group sessions conducted by trained health workers.

This report presents the salient findings of a randomized control trial designed to test the impact of the intervention on children's learning and development as well as behavior change in caregivers. It offers the government, policy makers, development partners, and other actors a contextually appropriate, sustainable, low cost, and replicable solution in enhancing ECCD coverage for the hardest to reach children in the country. The adoption of an alternative ECCD model like C4CD Plus could improve equitable access to ECCD services and also enhance Bhutan's progress toward meeting global educational goals.

Dr. Ugen Dophu  
Secretary  
Ministry of Health

# Acronyms

BHU	Basic Health Unit
C4CD	Care for Child Development
ECCD	Early Childhood Care and Development
ELDS	Early Learning and Development Standards
IDELA	International Early Learning and Development Assessment
MEAL	Monitoring Evaluation Accountability and Learning
MOE	Ministry of Education
MOH	Ministry of Health
RCT	Randomized Control Trial
RGOB	Royal Government of Bhutan
SDGs	Sustainable Development Goals (SDGs)
UNICEF	United Nations Children's Fund
VHW	Village Health Worker

# Acknowledgements

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We take this opportunity to convey our heartfelt gratitude to the donor Comic Relief Inc., USA for funding the project. With this support the Ministry of Health and the Ministry of Education collaboratively has been able to pilot this project to increase access for 3-5 year-old children in remote communities to relevant ECCD services.

We would also like to thank SCUS for mobilizing the fund and providing the critical technical support to facilitate the effective implementation of this pilot project.

We sincerely would like to convey our appreciation to Ms. Sara Poehlman, Ms. Sara Dang, and Ms. Lauren Pisani of SCUS, Dr. Karma Lhazeen, Director, Department of Public Health, and the National Director of SC Bhutan Country Office for their support in their different capacities at the various stages of the project design, implementation, and evaluation.

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Finally we would like to thank all the children, parents and caregivers, local leaders, dzongkhag health officers, health assistants, and village health workers (VHWs) from both the intervention and comparison sites from the four pilot Dzongkhags of Haa, Lhuentse, Tsirang and Zhemgang who came forward to our support in making this study possible.



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# Executive Summary

**E**ight years of concerted effort of the Ministry of Education (MOE) Royal Government of Bhutan (RGOB) to promote early Childhood Care and Development (ECCD) interventions through its center-based programs have benefitted 20% of 3-5 year-olds to access early learning opportunities. Notwithstanding these efforts, the unreached remain a significant 80% of the 3-5 years-old. Scattered population combined with the requirement to have a minimum of 15 children in order to establish a center based program are two operational restraining factors making it unfeasible for the MOE to ensure equitable expansion of ECCD services throughout the country.

Given the above operational bottlenecks, SCI in partnership with Ministry of Health (MOH) implemented an innovative intervention to provide a quality parenting program which is “The Care for Child Development Program (C4CD) Plus” pilot project. The pilot aimed to empower parents and caregivers of 3-5 years-old children with the skills to engage children in early literacy and math activities at home, responsive care and better nutrition for their holistic development through monthly group sessions conducted by trained Health Assistants (HAs) and Village Health Workers (VHWs).

The purpose of the pilot program is to test a contextually appropriate, sustainable, low cost, and replicable alternative model in a typically resource poor setting context in low and middle income countries that will guarantee access to non-center-based ECCD services and as well contribute towards children’s learning and development. To test the effectiveness of this pilot program a randomized control trial (RCT) evaluation was undertaken. The evaluation assessed the impact of the intervention by comparing the outcomes between two groups: the group which received the program– the intervention group – and the group which did not – the control group.

A baseline survey was undertaken in March 2017 to establish the pre-project conditions and set a reference point to measure the intended outcomes of the project. A follow up end line survey was conducted in October 2017 following the completion of the project activities. The data was collected using the International Development and Early Learning Assessment (IDELA) tool and a caregiver tool was used to capture the home learning environment. The salient findings from the impact evaluation revealed the following.

## **Key Findings**

### Children

- Children whose parents attended the C4CD Plus program learned significantly more than those in the control group in literacy, numeracy and overall IDELA score.

### Caregivers

- Caregivers who attended C4CD Plus sessions significantly increased learning and play activities with children compared to the control group.
- Caregivers who attended C4CD Plus sessions reported having significantly more reading materials and toys for children compared to the control group.

### Equity

- The same learning gains were observed for children from poorer and wealthier families, and those with more and less education.
- Children with better health (weighed more and more dietary diversity) and who did not have work/chore responsibilities learned more
- Learning gains are comparable to average ECCD center programs

## **Conclusion**

Results of the RCT impact evaluation find that the C4CD Plus program is both effective and equitable. Children in the intervention group gained significantly more than their peers in the control group, and caregivers significantly improved their early stimulation and care practices. In addition, strong learning gains were found for all children, including those from poor families and with uneducated mothers.

Impact of the program was also found to be comparable to center based programs included in the National ECCD study of 2015, which suggests that expansion of this program would substantially improve the equity of access to beneficial ECCD services to children in remote communities who otherwise would not receive these services.



Parents, caregivers and children from Berti (Zhemgang) after the group session

# CHAPTER 1: INTRODUCTION

## 1.1. Background

According to the 2016 ECCD Lancet series, 43% of children under five years of age in low- and middle-income countries, 250 million children, are at risk of not meeting their developmental potential<sup>1</sup>. Young children are at risk when they experience inadequate cognitive stimulation, stunting, poverty, and other forms of adversity. Stunting predicts poorer cognitive outcomes<sup>2</sup>; abuse harms the young brain and affects later learning, behavior and health<sup>3</sup>; even chronic neglect can lead to cognitive delays and poor executive functioning<sup>4</sup>. In Bhutan, stunting affects 21 percent of children under five<sup>5</sup>, 12.7 percent of the population lives in poverty<sup>6</sup>, less than seven percent of children of three to five years have three or more children's books, and only half were engaged by an adult household member in four or more stimulating activities in the last three days<sup>7</sup>. The Bhutanese children who risk not reaching their full potential may face lifelong consequences and never reach their full potential for learning, health and economic success.

The Royal Government of Bhutan, in the past eight years, with assistance of development partners such as Save the Children and UNICEF, has made sustained efforts to promote and institute various kinds of ECCD interventions including centre based programs, parenting education, and school based programs. As a result of these efforts, today there are more than 8000 children aged 3 to 5 in 232 centres and parenting education in all the Dzongkhags. In spite of the remarkable achievements in such a short span of time, there is much to be done. The ECCD center program of the Ministry of Education only covers 27% of the children in the country and are established only in sites that have 15 children of 3-5 years of age. This leaves out the more hard-to-reach children and families particularly

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1 McCoy, D.C., Peet, E.D., Ezzati, M., Danaei, G., Black, M.M., Sudfeld, C.R., et al. (2016). Early Childhood Developmental Status in Low- and Middle-Income Countries: National, Regional, and Global Prevalence Estimates Using Predictive Modeling. *PLoS Med* 13(6): e1002034. doi:10.1371/journal.pmed.1002034.

2 Black, M.M., Walker, S.P., Fernald, L.C., Andersen, C.T., DiGirolamo, A.m., Lu, C., McCoy, D.C., Fink, G., Shawar, Y.R., Shiffman, J., Devercelli, A.E., Wodon, Q.T., Vargas-Barón, E., & Grantham-McGregor, S. (2015). Early childhood development coming of age: science through the life course. *Lancet*: 1-12. [http://dx.doi.org/10.1016/S0140-6736\(16\)31389-7](http://dx.doi.org/10.1016/S0140-6736(16)31389-7).

3 National Scientific Council on the Developing Child. (2005/2014). Excessive Stress Disrupts the Architecture of the Developing Brain: Working Paper 3. Updated Edition. Retrieved from [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu)

4 Center on the Developing Child at Harvard University. (2012). The Science of Neglect: The Persistent Absence of Responsive Care Disrupts the Developing Brain: Working Paper 12. [www.developingchild.harvard.edu](http://www.developingchild.harvard.edu)

5 UNICEF, Annual Report 2015

6 National Statistics Bureau, Bhutan Poverty Assessment 2014

7 Multiple Indicator Cluster Survey, 2011

those living in remote parts of the country that are most in need of such services.

Access to Ministry of Education's (MoE) ECCD center program for 3-5 year-old children living in remote parts of the country and in communities which are underpopulated is not feasible. The Care for Child Development Program (C4CD) Plus pilot project will strengthen the existing C4CD program of the Ministry of Health (MoH) by including early stimulation, developmental and health care content, and train the health workers in Basic Health Units (BHUS) and Village Health Workers (VHWs) to deliver the program to parents/caregivers of 3-5 year-old children in the project sites. The purpose of the pilot program is to both increase access to quality ECCD services for 3-5 year-old children and contribute towards children's learning and development outcomes in the project sites. The results from the intervention will inform design and program implementation for possible replication in other districts as well as program design for 0-3 year old children in such areas.

## 1.2. Literature Review

The first five years of a child's life is a time of great promise and rapid change, when the architecture of the developing brain is most open to the influence of relationships and experiences. However, young children cannot learn on their own; relationships with caring, responsive adults and early positive experiences build strong brain connections<sup>8</sup>.

Research has shown that the provision of warm, responsive, and stimulating caregiving can effectively promote children's early cognitive, motor and socioemotional development, even in the presence of risk factors such as poverty and malnutrition<sup>9</sup>. The sheer quantity of parental talk is highly associated with vocabulary size in the early years of a child's life<sup>10</sup>, and a child's vocabulary size at age three predicts his or her reading at age nine, even after controlling for other factors<sup>11</sup>. In short, children's exposure to care, stimulation and play in these early years determines their lifelong trajectory: years in school, learning success, adult earnings, health, parenting of their own children, and even likelihood of being incarcerated or engaging in violence.

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8 Harvard University Center for the Developing Child, From Best Practices to Breakthrough Impacts: A science-based approach to building a more promising future for young children and families, [http://46y5eh11fhgw3ve3ytpwxt9r.wpengine.netdna-cdn.com/wp-content/uploads/2016/05/From\\_Best\\_Practices\\_to\\_Breakthrough\\_Impacts-3.pdf](http://46y5eh11fhgw3ve3ytpwxt9r.wpengine.netdna-cdn.com/wp-content/uploads/2016/05/From_Best_Practices_to_Breakthrough_Impacts-3.pdf)

9 Walker SP, Chang SM, Powell CA, Grantham-McGregor SM (2005) Effects of early childhood psychosocial stimulation and nutritional supplementation on cognition and education in growth-stunted Jamaican children: prospective cohort study. *Lancet* 366: 1804–1807. PMID: 16298218 and Nores M, Barnett WS (2010) Benefits of early childhood interventions across the world: (Under) investing in the very young. *Econ Educ Rev* 29: 271–282.

10 Hart, Betty and Todd R. Risley. (1995). Meaningful Differences in the Everyday Experience of Young American Children. Paul H. Brookes Publishing Co.: 1995.

11 Heckman, J., Masterov, D. (2004). Productivity Argument for Investing in Young Children. Working Paper 5, Invest in Kids Working Group Committee for Economic Development. [http://jenni.uchicago.edu/Invest/FILES/dugger\\_2004-12-02\\_dvm.pdf](http://jenni.uchicago.edu/Invest/FILES/dugger_2004-12-02_dvm.pdf)

The long term development of nations is compromised by the weak learning foundations for young children. The Sustainable Development Goals (SDGs) recognizes early childhood development as a global priority. Investing in the early learning foundations of young children is one of the smartest investments a country can make to address poor education outcomes, inequality, and break the cycle of poverty. Unless governments prioritize starting early, we won't get close to achieving inclusive and quality education for all by 2030. Investment in the early years is an investment in the human capital of whole nations.

Children who begin their lives without appropriate care and early stimulation are at a high risk of not reaching their full potential. Due to poverty, stunting, and lack of cognitive stimulation nearly half of 3- and 4-year-old children in low and middle income countries are unable to achieve their potential with respect to cognitive, socioemotional, or physical development<sup>12</sup>. As in Bhutan, many governments around the world are adopting policies aimed at providing more access to ECCD centers and this trend is predicted to continue. However, it will take many years to mobilize the resources necessary for the full scope of these policies to be realized, and in the meantime, millions of children could miss the opportunity to benefit from high quality early learning experiences unless alternative models of ECCD are embraced.

Additional stimulation during such a critical period of brain development could be the difference between success and failure in primary school and beyond<sup>13</sup>. A group of children in Rwanda were followed from ECCD entry into grade one and study results found that those who received the parenting program sustained the largest gains in learning and development compared to their peers who did not receive ECCD support. Further, this research showed that children who received the parenting programs had similar skills to children who had been enrolled in standard ECD centers.<sup>14</sup>

Although ECCD coverage is expanding rapidly in Bhutan, 83 percent of children lack access to center-based programs and are in need of early learning and development services. Village Health Workers (VHWs) work closely with rural communities throughout the country and are uniquely positioned to reach even the most remote families and children. Thus this project aims to train VHWs to deliver C4CD plus, a program focused on teaching parents how to better support their children's learning, health and development.

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12 McCoy DC, Peet ED, Ezzati M, Danaei G, Black MM, Sudfeld CR, et al. (2016) Early Childhood Developmental Status in Low- and Middle-Income Countries: National, Regional, and Global Prevalence Estimates Using Predictive Modeling. *PLoS Med* 13(6): e1002034. doi:10.1371/journal.pmed.1002034

13 <https://www.oecd.org/pisa/pisaproducts/46619703.pdf>

14 [http://resourcecentre.savethechildren.se/sites/default/files/documents/rwanda\\_elmi\\_endline\\_report\\_final.pdf](http://resourcecentre.savethechildren.se/sites/default/files/documents/rwanda_elmi_endline_report_final.pdf)

### **1.3. Research Objective**

To understand the impact of the C4CD plus pilot project on children's learning and development.

### **1.4. Research Questions**

Does receiving C4CD plus interventions improve child learning and development?

### **1.5. Research Hypothesis**

Parents/Caregivers who attend C4CD plus sessions will have improved learning and development practices with their children.



Assessing numeracy skills



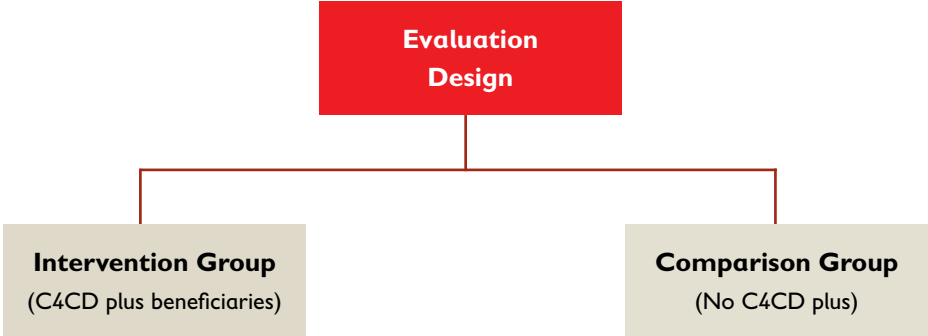
# CHAPTER 2: STUDY METHODOLOGY

## 2.1. Type of Study and Study Design

This study is a short term impact evaluation of C4CD plus pilot project to document the benefits of the program for children’s learning and developmental outcomes. The learning and development of children before and after the intervention was measured for both the intervention and control group. It will gauge challenge/issues in the area of the pilot program’s intended impact on children and in improvements required in project implementation thereby helping to strengthen the C4CD plus interventions prior to scaling up.

Four dzongkhags were purposefully selected to evaluate the impact of the C4CD plus interventions on the following criteria: low center based ECCD program coverage, existence of VHWs, and representing national geographic regions. The program applied random assignment of groups within the four dzongkhags to intervention and control.

Figure 1: Evaluation Design



### Target population

- Children 3-5 years old
- Caregivers of 3-5 years old

### Proposed Intervention

SC Bhutan and MOE have worked closely to support access to quality Early Childhood Care and Development (ECCD) program for 3-5 year old children in the country. The close collaboration have resulted in establishing ECCD centers, curriculum and training guide development as well as an ECCD parenting education program for parents of young children. In 2016 Crossing the Pass: Scaling up Emergent Literacy & Math (ELM) project

helped scaling up the efforts of SC and MOE in provisioning quality ECCD services in the country by introducing the ELM package in all ECCD center across the country. However, despite the concerted efforts there are challenges of reaching ECCD services to the children of sparsely populated communities living in the remote parts of the country where ECCD center program is not feasible. The center based program currently caters to only about 20% of the children and a large chunk 80% do not have access to ECCD services.

In 2017 SC established partnership with Ministry of Health (MOH) to initiate a contextually appropriate, low cost alternative model to center based ECCD program to reach the most hard to reach children population in the country. The alternative model Care for Child Development Plus (C4CD Plus) builds on the existing Care for Child Development (C4CD) of the MOH by reaching ECCD services to the remotest communities. It enables parents and caregivers of children 3-5 year olds to attend monthly group sessions on early stimulation, health & hygiene thus empowering them with the skills to support their children's holistic development at home. The C4CD plus project has nine parenting sessions out of which seven sessions are on early stimulation and two on health and hygiene. Parents, caregivers and children attend the group sessions delivered by Health Assistant (HA) and Village Health Workers (VHWs). Each session has three simple games and activities aimed at building foundational skills in ELM and raising healthy children which the parents and caregivers can play with their children. The project also encouraged parents to practice session specific activities at home and reading with their children. This was made possible by allowing parents to borrow storybooks and picture books from small book bank and take home low literacy activity cards.

## **2.2. Sample size and selection criteria, unit of analysis**

A stratified cluster random sampling approach was used. Random selection began at the gewogs (blocks) for program assignment, and then villages within gewogs was randomly selected for inclusion in the study. The villages without the VHWs and/or with ECCD centers were excluded from the sampling frame. All children 3-5 years old and their caregivers from the selected chiwogs were included in the sample.

For this sample size calculation `sampsi` command in Stata and input assumptions from national impact study was used.

```
sampsi 1 1.35, sd(1) a(.05) p(0.8) pre(1) r01(.53)
```

- the first two numbers identify minimum detectable effect of 0.35 standard deviations (1.35 – 1). This threshold was determined based on the results of previous research in Bhutan and elsewhere and represents what we consider the minimum difference between children's skills in the intervention and control group that can be considered meaningful.

- sd identifies one standard deviation to be used in the calculation
- $\alpha$  is level of significance standard for the results ( $p < .05$ ) which is a standard social science standard threshold
- $p$  is for power = .8 (or 80%) which is a social science standard threshold
- $pre(1)$  signifies that we will conduct 1 baseline assessment
- $r(1)$  (.53) is the correlation between children's baseline and endline IDELA scores – taken from the national impact study

When measuring change over time, these assumptions come together to suggest a minimum sample of 121 per intervention arm (242 total). The number does not account for attrition so if we add 20% loss of children over time, the sample would increase to 145 per arm.

### 2.3. Survey Instruments<sup>15</sup>

A baseline assessment of children's learning and development was undertaken at the beginning of the intervention (March 2017), and a follow up assessment with the same children occurred after the intervention in October 2017.

The study used three data collection instruments:

#### i. International Development and Early Learning Assessment (IDELA)

The International Development and Early Learning Assessment (IDELA) was used to measure children's learning and development across domains such as motor, literacy, numeracy, social-emotional development, approaches to learning, spiritual/moral/cultural and health related practices. IDELA was developed by Save the Children over the course of four years for the assessment of children aged 3.5 – 6.5 years. Testing and modifying the tool over multiple years across eleven countries (Bangladesh, Bhutan, Egypt, Ethiopia, Indonesia, Mali, Malawi, Mozambique, Pakistan, Rwanda, and Zambia) has resulted in a 22-item assessment that balances three key dimensions: psychometric rigor, feasibility, and international applicability<sup>16</sup>.<sup>17</sup> As a result, IDELA is easily translated and administered in varied cultural contexts, and has strong reliability and validity. Before it was used in Bhutan the tool was contextualized through a wide stakeholder consultation and three items were added specifically to correspond to the Spiritual, Moral and Cultural domain

15 Study tools & STATA .do files will be shared through email upon request to: nar:chhetri@savethechildren.org

16 Pisani, L., Borisova, I., & Dowd, A. J. (2015). International Development and Early Learning Assessment Technical Working Paper. Washington, DC: Save the Children. Retrieved from <https://idela-network.org/resource/international-development-and-early-learning-assessment-technical-working-paper/>.

17 Wolf, S., Halpin, P., Yoshikawa, H., Pisani, L., & Dowd, A. J. (2016). Assessing the Construct Validity of Save the Children's International Development and Early Learning Assessment (IDELA). Washington, DC: Save the Children. Retrieved from <http://resourcecentre.savethechildren.se/library/assessing-construct-validity-save-childrens-international-development-and-early-learning>.

corresponding to Bhutan's Early Learning and Development Standards (ELDS).

**ii. Caregiver Questionnaire:**

A caregiver questionnaire was used to gather information about parenting and health care practices, and home environment. Items include information about parent education, access to learning materials in the home, caregiver-child interactions in the home (play, learning and discipline), care and feeding practices and socioeconomic indicators.

**iii. Observation checklist:**

During the intervention period regular monitoring was done using the quality observation checklist to ascertain the quality. Monitors observed facilitation of the parenting sessions to check for health assistants and village health workers' understanding and effective delivery of information as well as caregiver participation in session activities.

**2.4. Data collection procedures**

To enhance data accuracy, quality and timeliness of data for analysis and reporting data collection was done using tablets with KoBo software<sup>18</sup> by enumerators who were university graduates. They were trained four days on using the tools and two days on using tablet based application. The training was supported through detailed presentations of the survey tools/instruments, role playing, actual practice in using the tool discussions and a pilot testing for clarity & inter-rater reliability. To enhance data collection in a consistent manner across enumerators a glossary of key terms and phrases was translated into major local languages and will be extensively used during the training.

The enumerators were also trained on ethical considerations including working with children, confidentiality and the use of consent forms. Study data will be kept in a password protected account owned by the study PI and SC Bhutan MEAL. Confidentiality was taken care during analysis by not reporting any results at individual level.

**2.5. Limitations of the Study**

The selection of the districts for pilot interventions was based on the presence of relatively limited number of center based program in operation. Although program sites were selected based on random assignment of program to intervention and control the choice of the districts was purposive. The baseline sample was smaller than planned because some villages need to be dropped due to either lack of VHW in the community or access to school for 3-5 year old children, which were conditions not previously known. In addition, the end line data collection found around 19% of children missing from baseline to end line. Loss of study program participants to some extent has affected the sample size by reducing the study's statistical power to detect effects.

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18 <http://www.kobotoolbox.org/>



Parents borrowing children's books from the project's book bank

# CHAPTER 3: STUDY RESULTS

## 3.1. Overview of study population

### Attrition

Overall, 45 out of 289 families observed at baseline were unable to be found at the time of the endline assessment (table 1). Therefore endline analyses will be conducted on the remaining 244 children and caregivers who were interviewed at baseline and endline. The children missing at endline were predominantly from the intervention group. An attrition analysis found that younger mothers were significantly more likely to be missing at endline than older mothers, and families speaking Kurtoe were more likely to be missing at endline than families speaking other languages. There were no other background or learning variables found to be significantly different between caregivers and children who were found at endline and those who were missing.

**Table 1: Sample at baseline and endline**

	Baseline sample	Endline sample	% Missing
Intervention	167	124	26%
Control	122	109	11%
Total	289	244	19%

The C4CD plus end line study covered four Dzongkhags (districts) and out of which 244 children and equal number of caregivers participated in the survey. Table 2 presents the distribution of study sample disaggregated by program type and sex. Overall 52% of the children were girls and 48% boys.

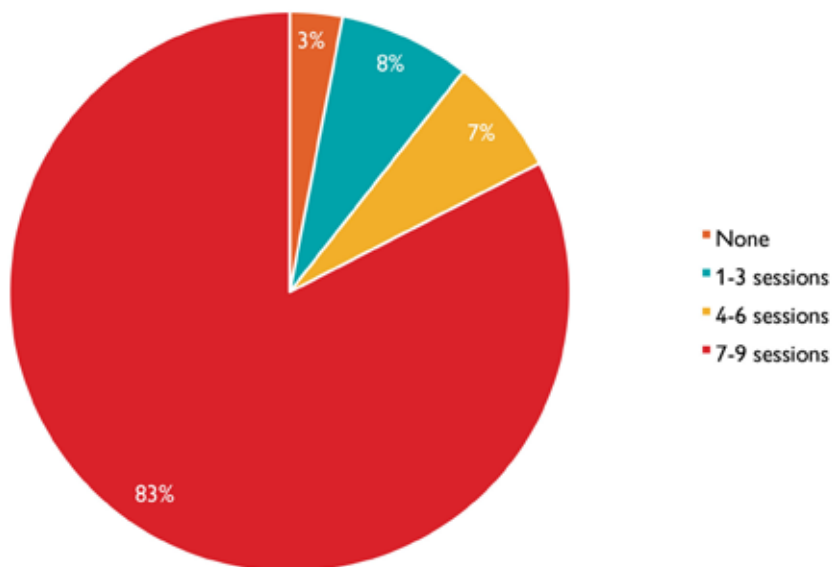
**Table 2: Overview of end line sample by program type ad sex**

	Boy	Girl	Total
Intervention	65	70	135
Control	51	58	109
Total	116	128	244

### Attendance at C4CD Plus sessions

Before discussing impact of program activities on children and caregivers, it is relevant to review attendance and uptake of the program from caregivers. This will give context to the results shared in the next sections of the report. Overall, 97 percent of caregivers in the intervention group reported that they or someone in their family attended C4CD plus group sessions, and on average caregivers reported attending 8 out of 9 sessions (Figure 1). This shows very strong uptake of the program.

Figure 2: Average reported attendance at parenting sessions



The majority of sessions were held at outreach centers, but some also met at BHUs and other places. The majority of caregivers reported “strongly agreeing” that sessions were interesting, enjoyable and that they learned valued things. Also, caregivers reported sharing what they learned with others in their family and community. The most common person that caregivers reported sharing with was others in the community (84%), followed by sisters (26%), mother-in-laws (23%), and brothers (19%). These findings further suggest that parents appreciated the C4CD Plus group sessions and found their new knowledge important enough to share with others in their community.

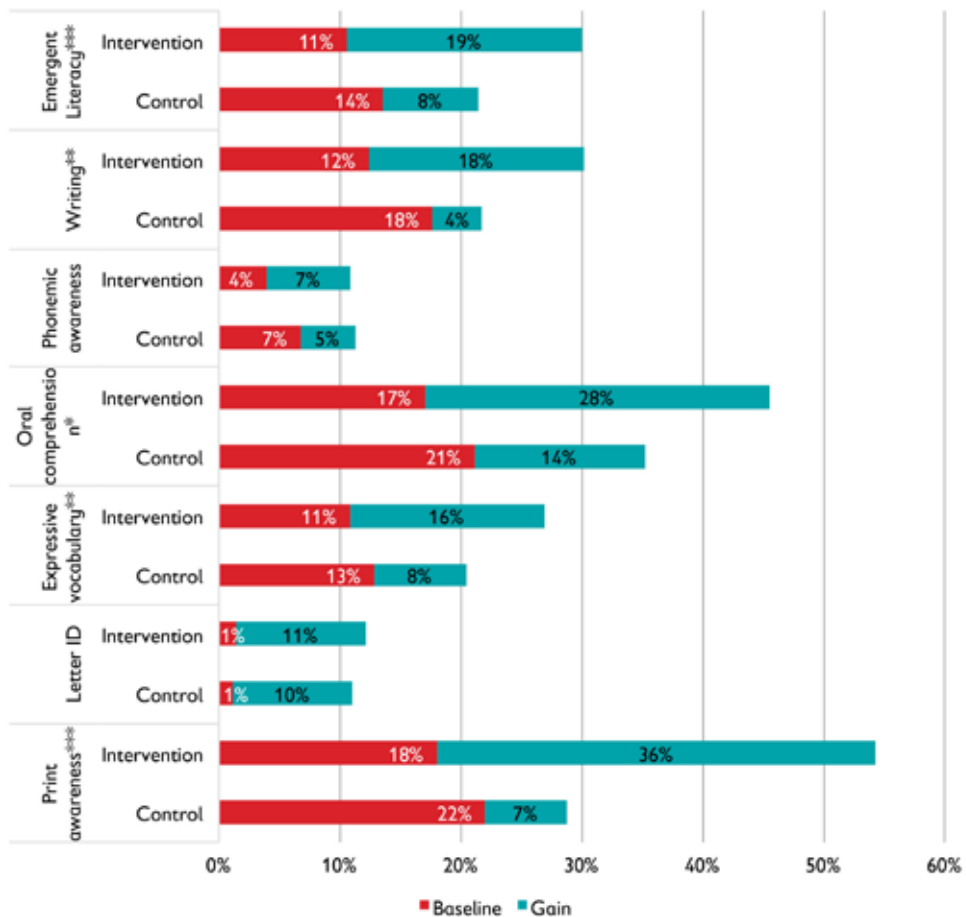
### 3.2. Children learning and developmental skills by domains

This section provides children’s learning and developmental skills at the end line measured through the direct assessment of children’s skills using the IDELA tool. It presents the average percentage score in each of the six domains including literacy, numeracy gross and fine motor, numeracy, literacy, social-emotional, spiritual, moral and cultural development, and health and hygiene. Average percentage correct for each item was calculated by dividing the total points correct by the total number of possible points for that item. Domain scores were calculated by adding the percentage correct for each item within a domain and dividing by the total number of items. Calculations of changes in learning over time were conducted using multivariate regression analyses that controlled for baseline scores, children’s age, children’s gender and clustered standard errors within Chiwogs (villages).

### 3.2.1. Literacy Skills

Endline results display a range of skill growth in different areas of children’s emergent literacy. On average, children in the intervention group made significantly stronger gains in literacy than children in the control group (Figure 2). Looking at specific items, children in the intervention group gained significantly more in the areas of writing, oral comprehension, expressive vocabulary, and print awareness. There were no significant differences in the gains made by boys and girls, but older children did make significantly greater gains than younger children (Figure 4).

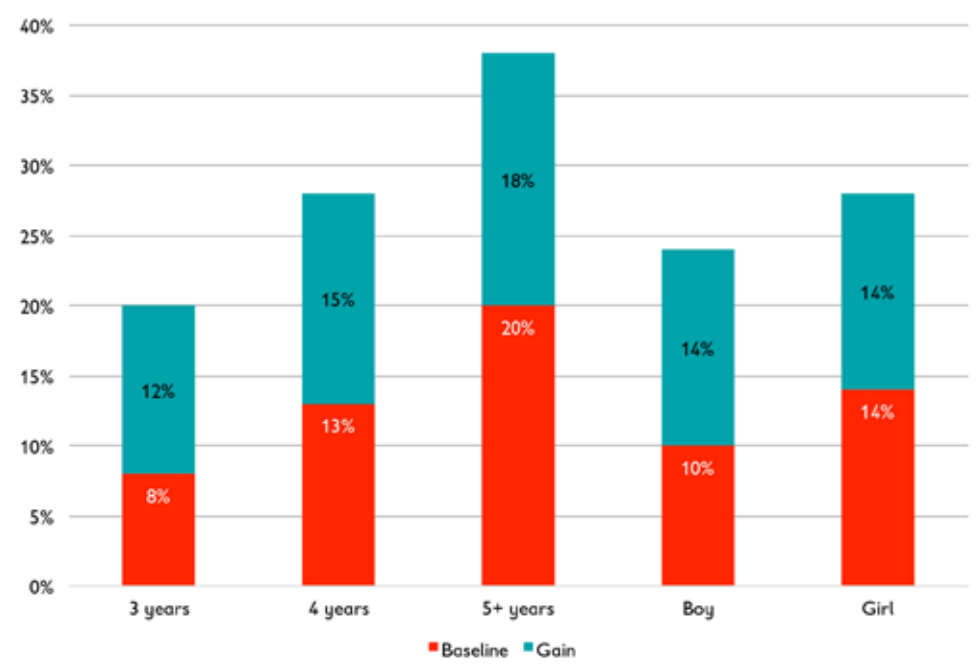
Figure 3: Baseline and gains in literacy scores disaggregated by item and program type



\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1



Figure 4: Baseline and gains in literacy scores disaggregated by age group and sex

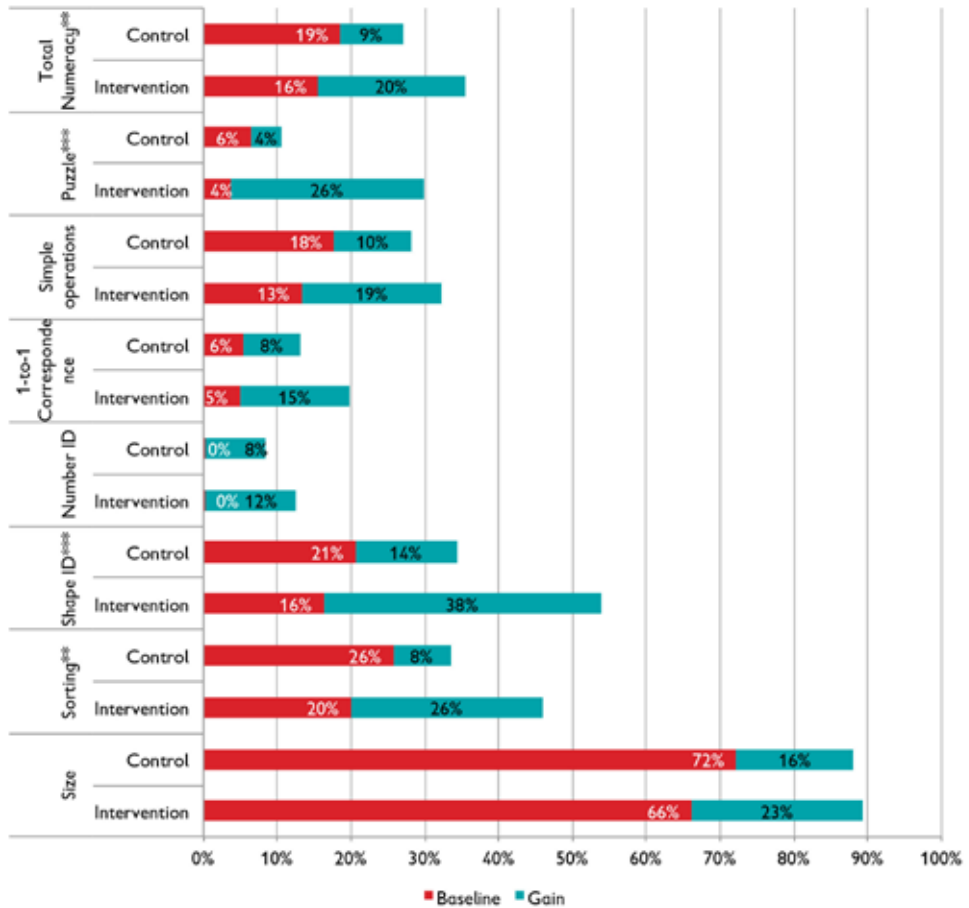


### 3.2.2. Numeracy skills

From baseline to end line children from the intervention group gained significantly stronger skills than children from the control group and skills relating to such as sorting, identifying geometrical figures, and completing a puzzle. The weakest gains were seen in number recognition and performing one to one correspondence. Overall children made strongest gains in different shape identification (Figure 5).

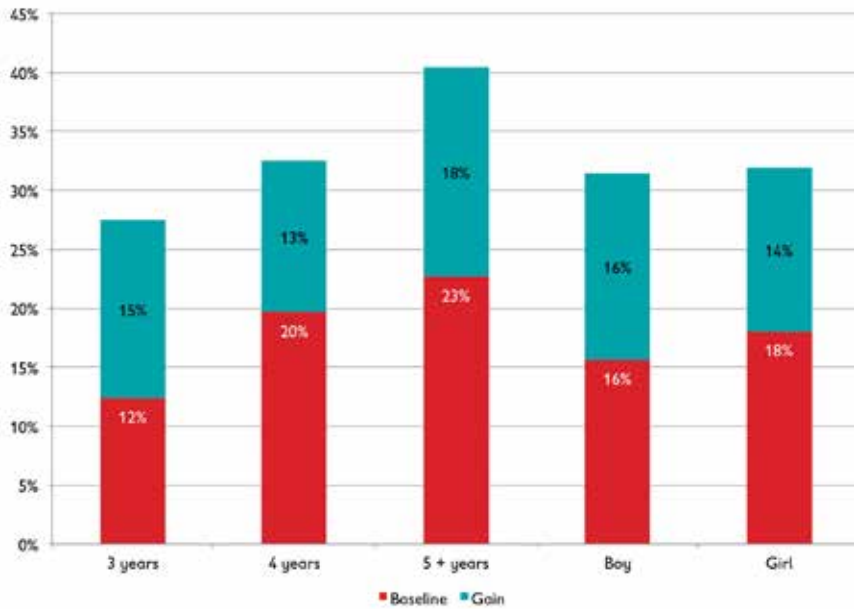


Figure 5: Baseline & gains in numeracy disaggregated by numeracy items and program type



\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

Figure 6: Baseline & gains in numeracy disaggregated by age group and sex



The end line data showed no significant differences by gender in the development of emergent numeracy scores across program type. Age differences here too displayed the natural pattern with children in older age cohort performing better than younger age cohort as shown in Figure 6 older children gained more numeracy skills compared to younger children.

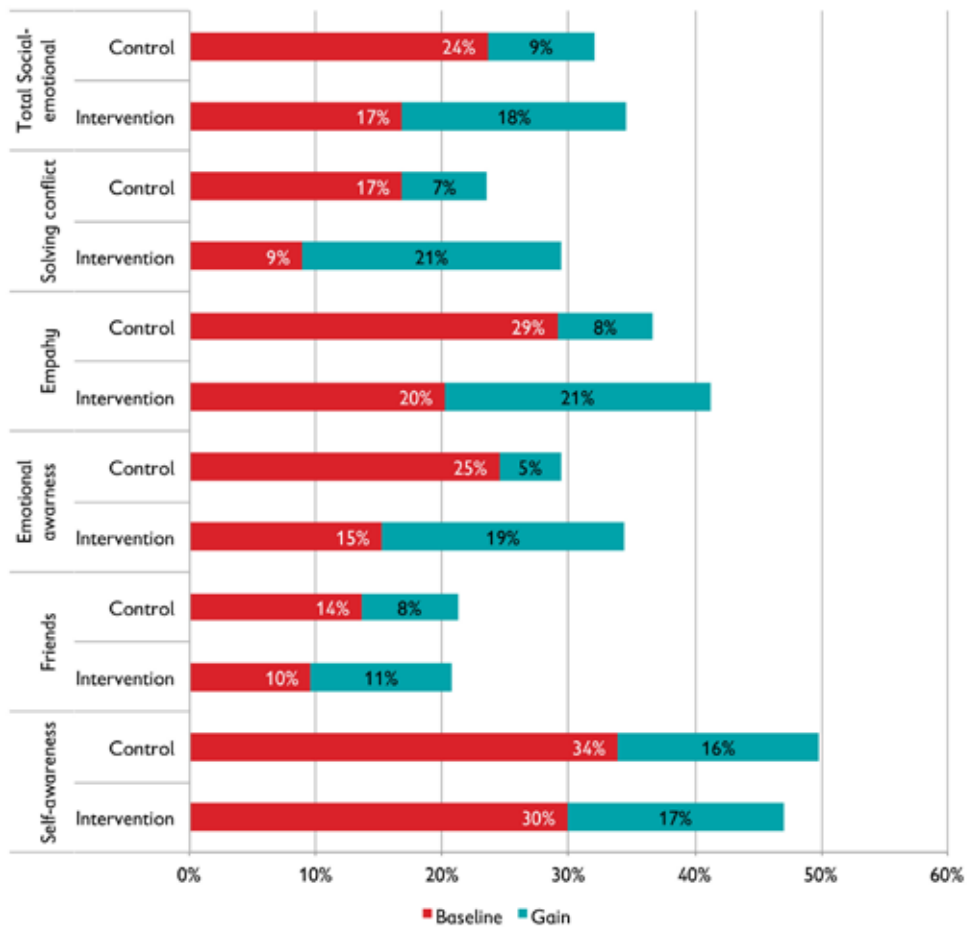


Children engaged in writing or drawing activity during the group session

### 3.2.3. Social-Emotional Skills

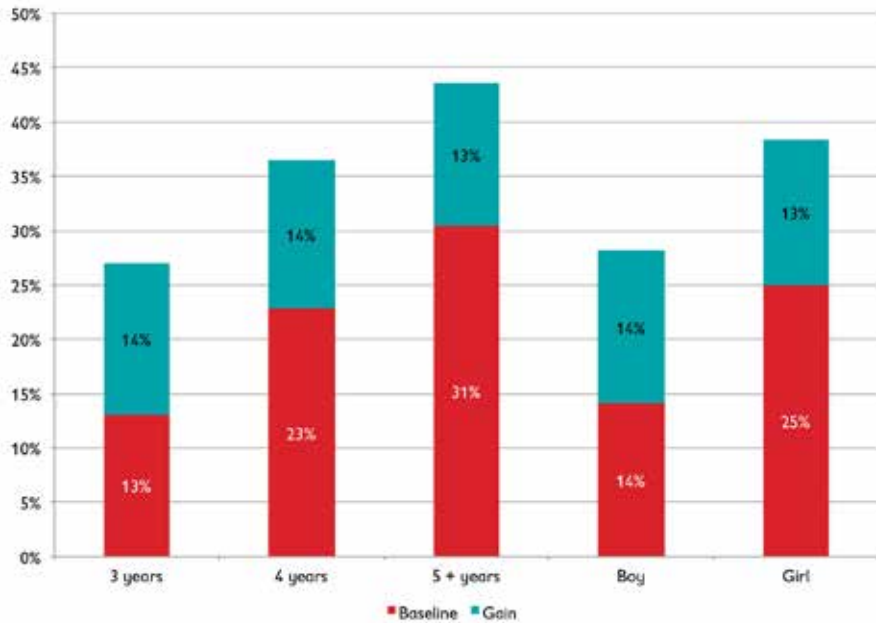
Overall, there were no significant differences between the socio-emotional skill growth of children in the intervention and control groups. Children from the intervention group exhibiting the strongest skill growth from baseline to end line in the areas of solving conflict and showing empathy but there were no significant differences compared to the children in the control group (Figure 7).

Figure 7: Baseline & gains in social-emotional (SOE) disaggregated by SOE items and program type



\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

Figure 8: Baseline & gains in social emotional by age group and sex



As in other domains, no significant differences by sex were seen overtime in acquiring social emotional skills. There were also no differences in the skill gains made by children of different ages (Figure 8).

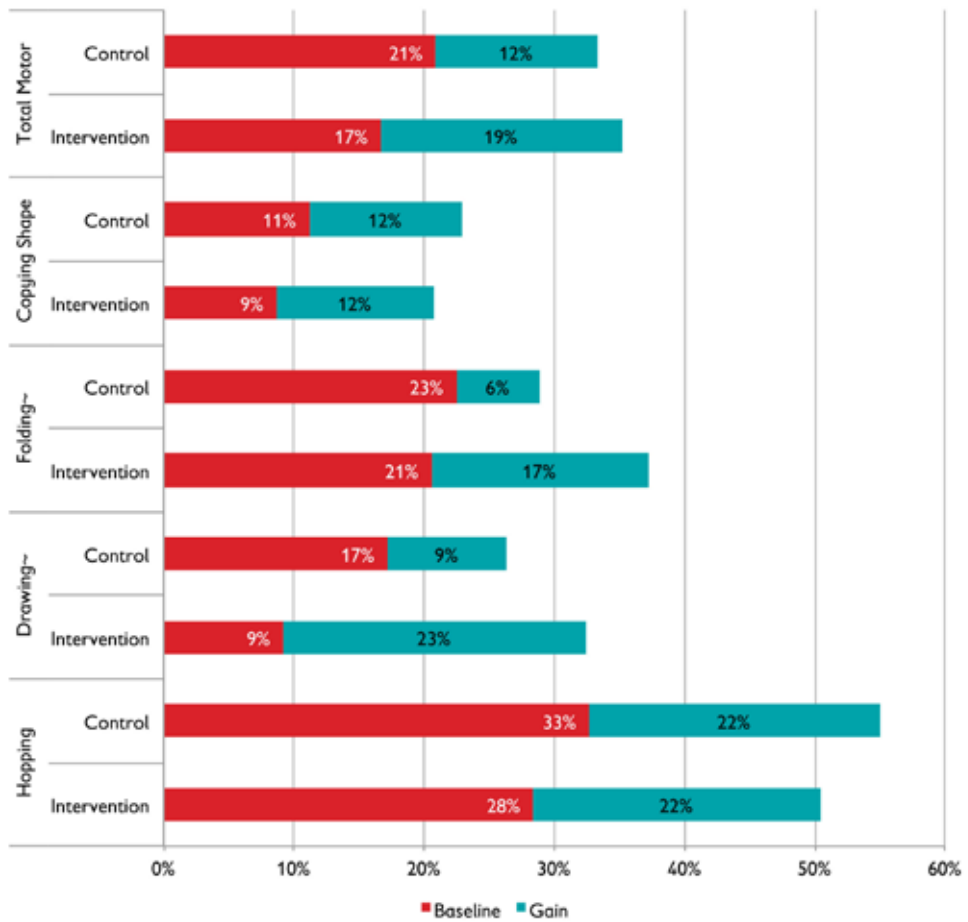


Parent helping her child scribble in the sand

### 3.2.4. Motor Skills

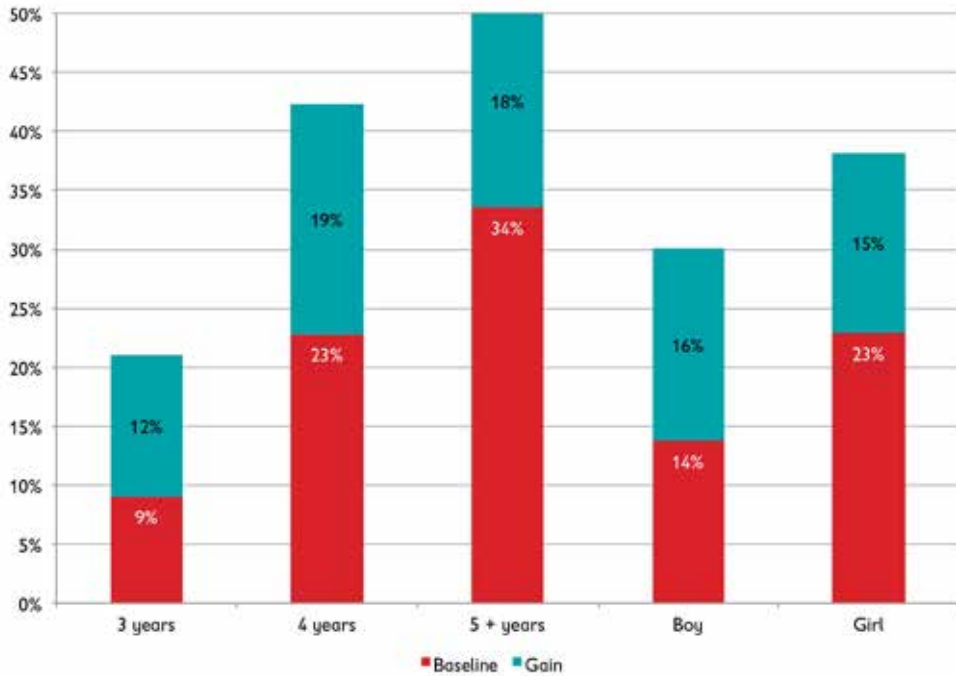
Gains in motor skills overtime during the course of the program period was in favor of intervention group but the differences in gains were not statistically significant. Overall children from the intervention group demonstrated strongest skills in drawing activity, hopping and folding activity related to fine motor skills. Children gained lesser in copying a shape (Figure 9).

Figure 9: Baseline and gains in motor skills disaggregated by motor items & program type



\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

Figure 10: Baseline & gains in motor skills by age group and sex

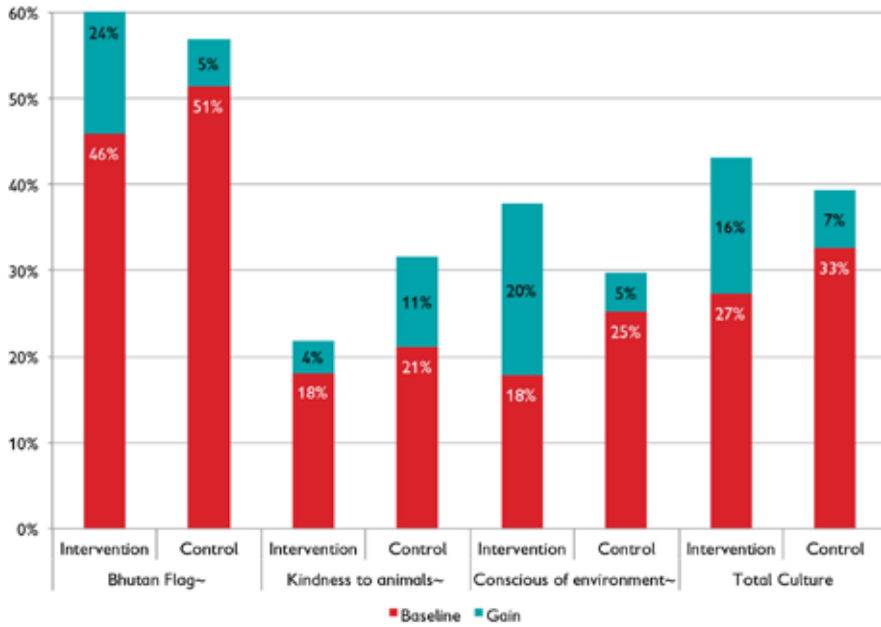


There is no significant difference between boys and girls in their motor development performance across program type, and the older age cohort gained more skills in this domain over time (Figure 10).

### 3.2.5. Spiritual moral and cultural skills

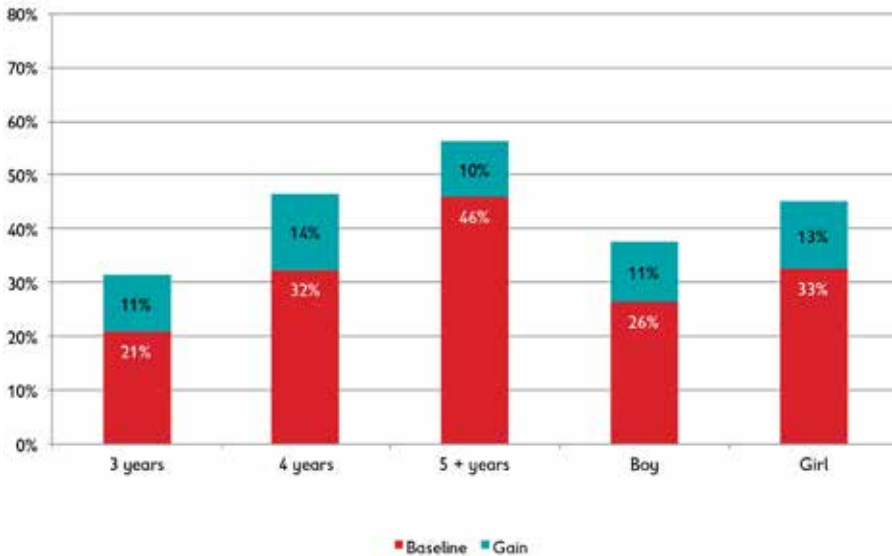
Across the three spiritual, moral and cultural items children demonstrated the strongest gains in identifying Bhutanese flag followed by gains in being able to show being conscious of the environment. Children however developed weaker gains concerning kindness to animals. There were only marginally significant differences between the gains made by children in the intervention and control groups (Figure 11). Both boys and girls alike displayed these competitive cultural development skill without significant gender differences. As with other developmental domains, older children gained more than younger children (Figure 12).

Figure 11: Baseline and gains in spiritual, moral & cultural domain disaggregated by cultural items and program type



\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , ~  $p < .1$

Figure 12: Baseline & gains in spiritual, moral & cultural domain by age group and sex

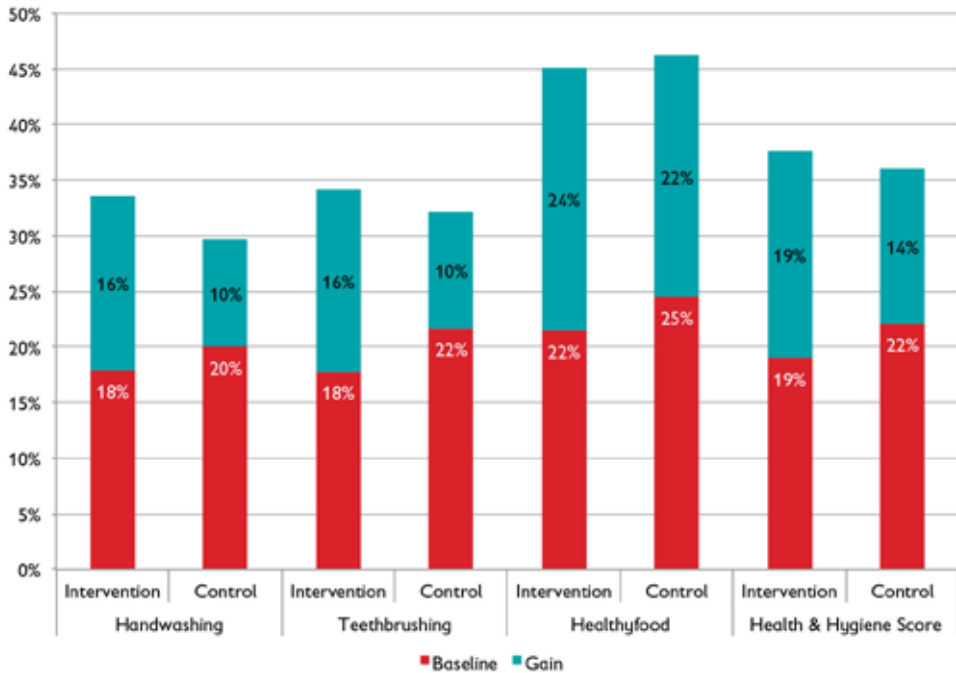




### 3.2.6. Health & Hygiene

In the health and hygiene domain gains were in positive direction but without any significant differences between the intervention and the control group (Figure 13). There was no gender differences in gains in health and hygiene skills, and children from the older age cohort gained better skills in this domain (Figure 14).

Figure 13: Baseline and gains in health & hygiene domain disaggregated by health&hygiene items and program type

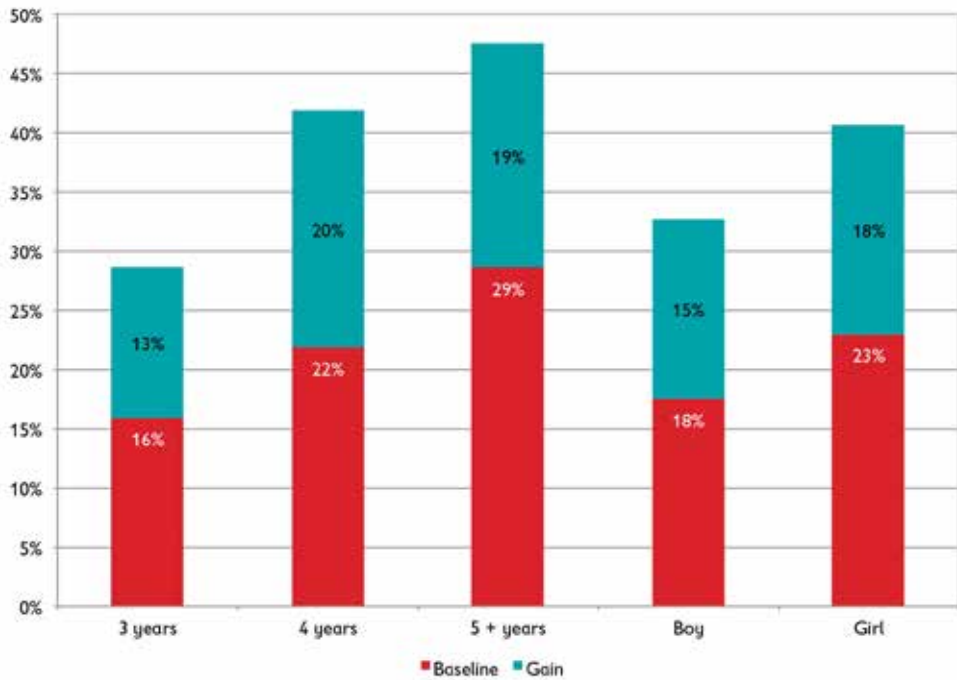


\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1



Parents engaged in an activity to understand balanced diet

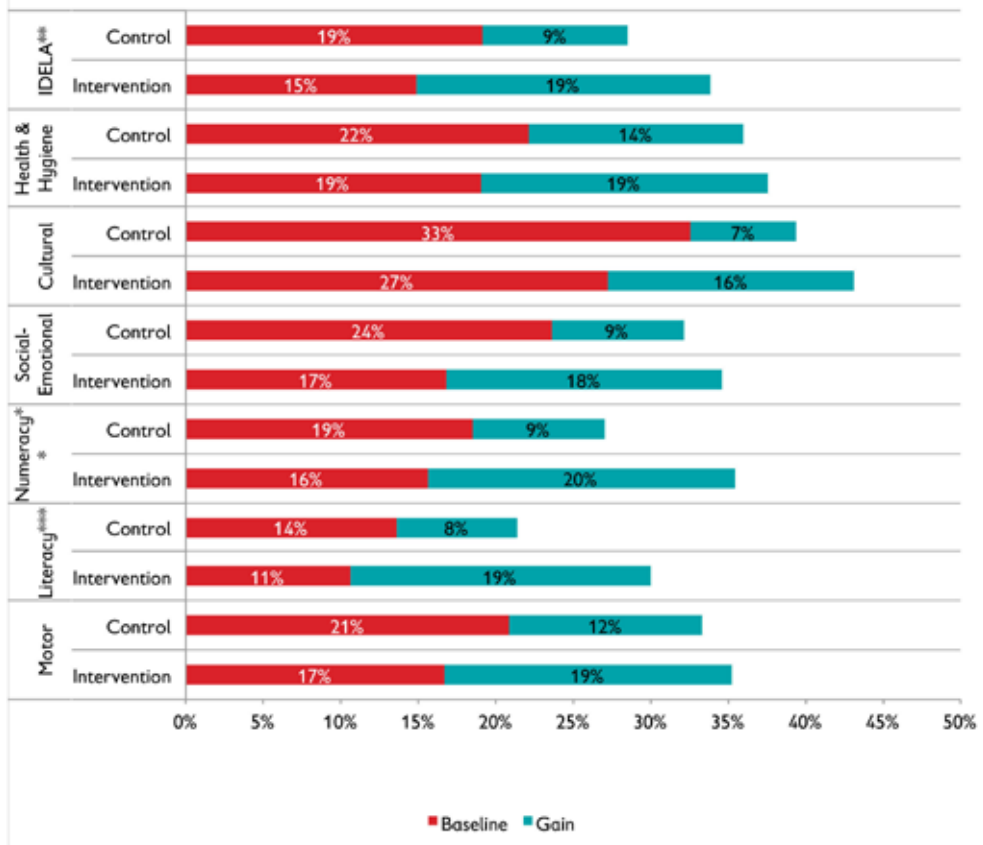
Figure 14: Baseline & gains in health & hygiene domain by age group and sex



### 3.2.7. School Readiness Scores (Overall IDELA)

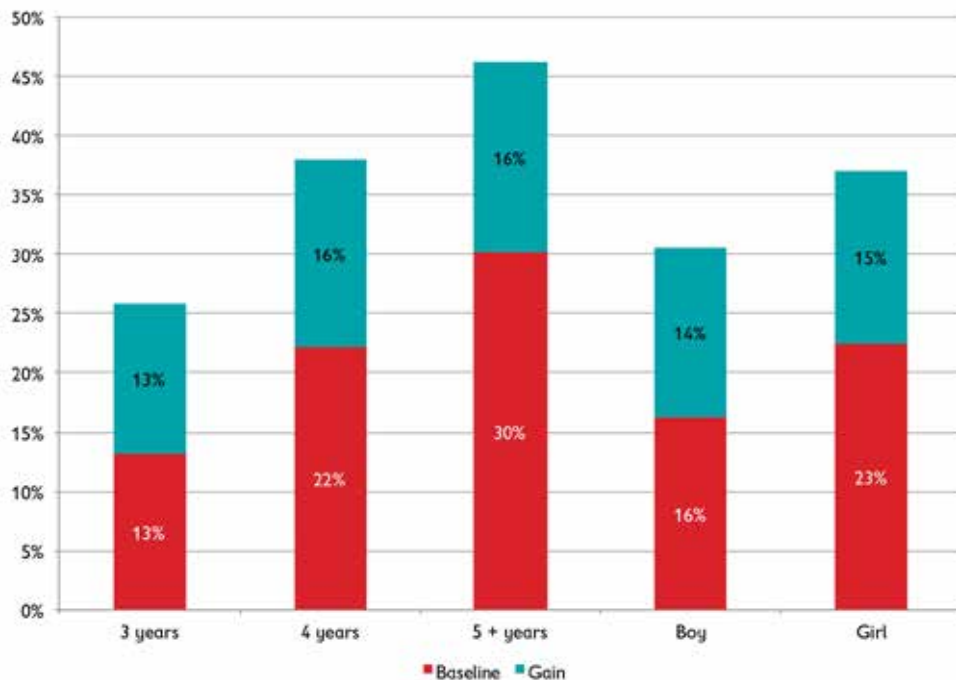
When computing total IDELA scores firstly each domain score was obtained by computing proportion correct for each direct child assessment item in each of the six domains and then added together and divided by the total number of items in each domain. Secondly total IDELA score was computed by summing the total domain scores across six domains and then divided by the number of domains (six) (Figure 15).

Figure 15: IDELA baseline and gains by domain and program type



\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

Figure 16: Baseline & gains in IDELA disaggregated by age group and sex



The total IDELA end line scores showed that although children at the beginning had a similar school readiness skills across program type with a total IDELA score of 18%, gains were stronger for children from the intervention group with a 50% gain from baseline to end line. Children in the intervention group showed a significant difference in gains in numeracy and literacy. Overall older children made significantly stronger IDELA gains as compared to younger children and the findings showed no significant gender differences between boys and girls (Figure 16).

### 3.3. Caregiver Results

Caregivers were also surveyed before and after the C4CD Plus intervention was implemented in order to document any potential changes in their behavior and care of children. As discussed above, the sample for this study changed from the time of the pre- and post-test, mostly due to the dropping of some villages that did not have available VHWs. An overview of the characteristics of the final group of families included in the study are displayed in table 3. On average, mothers and fathers reported low levels of education and literacy. There were no significant differences between the measured characteristics of parents in the intervention and control groups.

**Table 3: Family characteristics**

	Control	Intervention	Significant difference	Overall
Mother age	31.5	30.8		31.1
Mother Education Completion				
None	57%	60%		59%
Primary	14%	13%		13%
Non-formal education	6%	7%		7%
Secondary	22%	21%		21%
Higher education	1%	0%		0%
Mother is literate	44%	40%		42%
Father age	33.8	35.2		34.6
Father education completion				
None	45%	48%		47%
Primary	26%	25%		26%
Non-formal education	14%	12%		13%
Secondary	13%	10%		11%
Higher education	1%	5%		3%
Father is literate	66%	62%		64%
No. children at home	2.7	2.9		2.8
Home language: Dzongkha	34%	23%		28%
Home language: Sharchopkha	8%	22%		16%
Home language: Lhotshamkha	25%	22%		23%
Home language: Kurtoepkha	15%	34%		25%
Home language: Khengkha	28%	36%		32%
Home language: English	1%	1%		1%
Home language: Other	12%	8%		10%

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , ~  $p < .1$

Parents were asked to report on changes in their health related behaviors. Parents in the intervention group tended to report greater increases in handwashing and food diversity than parents in the control group, and both groups reported increases in teeth brushing. However, there were no significant differences in caregivers' health behaviors at endline (Table 4).

**Table 4: Health, hygiene and nutrition**

	Baseline		Endline		Significant difference (Endline)
	Control	Intervention	Control	Intervention	
No. times handwashing per day	2.7	2.8	2.7	3.2	
No. times teeth brushing per day	0.3	0.3	1.2	1.3	
No. different types of food given to child per day	2.9	2.3	2.5	2.8	
Child sick with cough, fever or diarrhea in past 2 weeks (0-3)	0.7	0.8	0.7	0.7	

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

Parents were also asked about the learning materials their children had access to, and the activities they engaged in with their children. At endline, caregivers in the intervention group reported having significantly more types of books at home and marginally significantly more types of toys than caregivers in the control group. The C4CD Plus program did not gift any books or toys to families, but they did have books available that parents could borrow during the parenting sessions to bring home and return at next session (Table 5)..

**Table 5: Learning materials**

	Baseline		Endline		Significant difference (Endline)
	Control	Intervention	Control	Intervention	
No. types of books	1.8	2.3	2.1	3.0	**
Storybook	20%	27%	35%	69%	***
Textbook	27%	39%	36%	49%	~
Magazine	19%	26%	22%	24%	
Newspaper	28%	35%	17%	28%	
Religious	57%	76%	59%	85%	***
Coloring	27%	25%	32%	37%	
Comics	6%	8%	6%	15%	
No. types of toys	4.0	4.0	4.7	5.3	~
Homemade	36%	47%	59%	73%	
Shop	84%	76%	84%	76%	
Household object	72%	72%	75%	90%	*
Outside object	93%	93%	95%	97%	
Drawing/writing	59%	57%	60%	76%	~
Puzzle	8%	8%	10%	18%	
Hand-eye	24%	28%	35%	38%	
Color/shape	12%	8%	17%	29%	*
Numbers/counting	13%	13%	22%	39%	~

\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , ~  $p < 0.1$

Caregivers in the intervention group also reported engaging in significantly more learning and play activities with their children than caregivers in the control group. Specifically, reading with children, writing/drawing and teaching numbers showed the strongest gains (Table 6). Caregivers in the intervention group were also significantly less likely to report hitting their children at endline compared to caregivers in the control group. The most substantial behavior changes were reported with mothers, but smaller changes were also observed for fathers and other caregivers (Table 6).

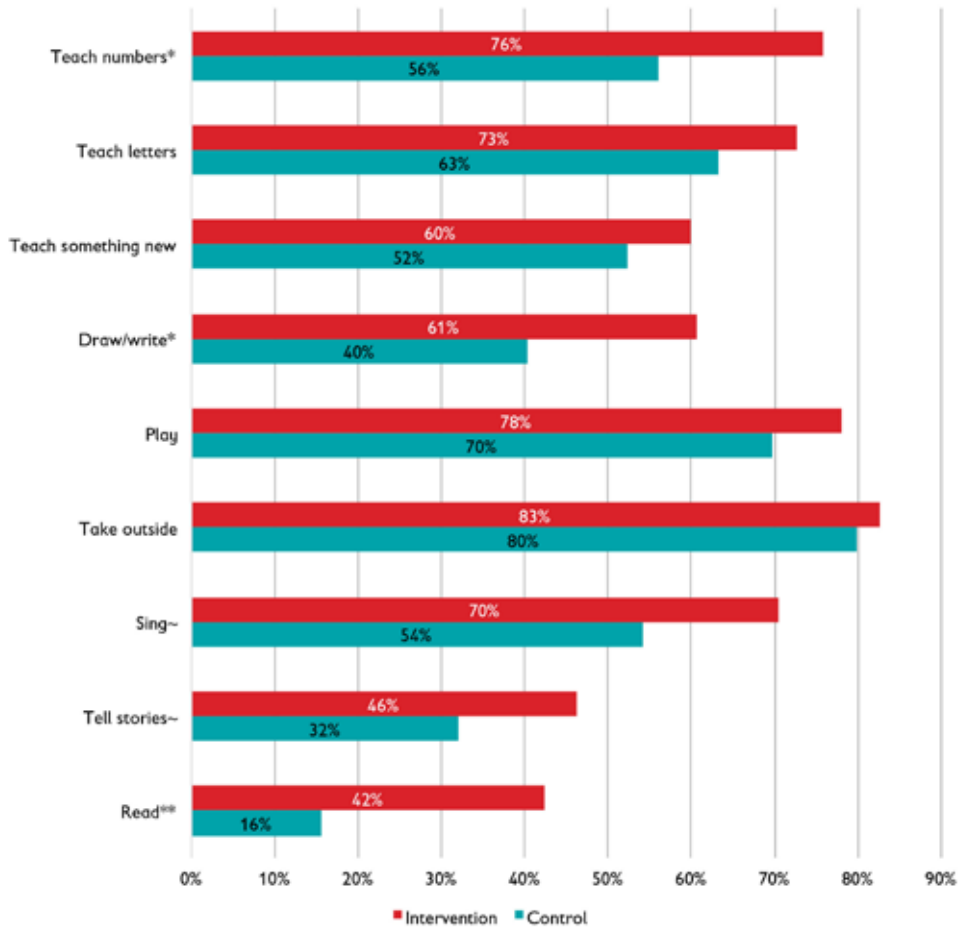
**Table 6: Learning, play and discipline activities**

	Baseline		Endline		Significant difference (Endline)
	Control	Intervention	Control	Intervention	
No. learning/play activities	4.2	3.6	4.6	5.9	*
Read	17%	16%	16%	42%	**
Tell stories	28%	27%	32%	46%	~
Sing	58%	50%	54%	70%	~
Take outside	77%	70%	80%	83%	
Play	54%	55%	70%	78%	
Draw/write	28%	22%	40%	61%	*
Teach something new	59%	41%	52%	60%	
Teach letters	52%	36%	63%	73%	
Teach numbers	48%	43%	56%	76%	*
No. harsh discipline behaviors	1.9	1.3	2.1	1.8	
Spank	91%	73%	91%	82%	~
Hit	26%	20%	62%	36%	*
Yell	73%	37%	53%	57%	

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1



Figure 17: Learning and play activities at endline



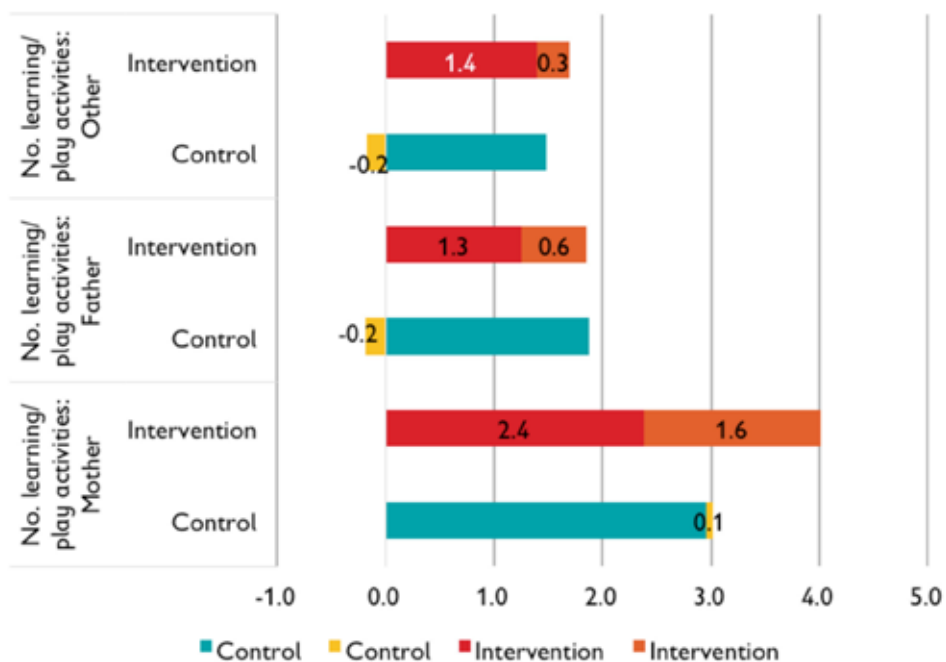
\*\*\*  $p < 0.001$ , \*\*  $p < 0.01$ , \*  $p < 0.05$ , ~  $p < .1$

**Table 7: Learning, play and discipline activities, by caregiver**

	Baseline		Endline		Significant difference (Endline)
	Control	Intervention	Control	Intervention	
No. learning/play activities: Mother	3.0	2.4	3.0	4.0	~
No. learning/play activities: Father	1.9	1.3	1.7	2.3	
No. learning/play activities: Other	1.5	1.4	1.3	1.7	
No. harsh discipline behaviors: Mother	1.7	1.2	1.9	1.5	~
No. harsh discipline behaviors: Father	0.5	0.3	0.8	0.5	~
No. harsh discipline behaviors: Other	0.5	0.1	0.3	0.3	

\*\*\* p<0.001, \*\* p<0.01, \* p<0.05, ~ p<.1

**Figure 18: Learning and play activities, by caregiver**



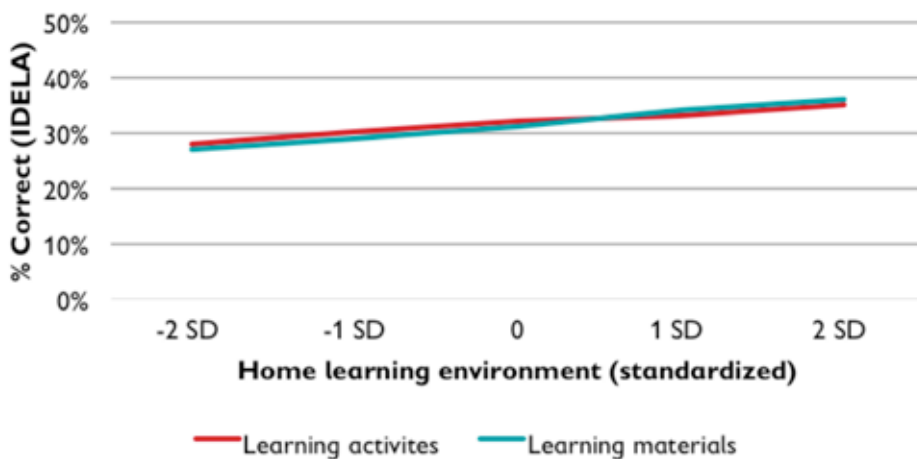
### 3.4. Equity analysis

Merging data from the IDELA tool and the caregiver questionnaire allows for analysis of the relationships between children’s development and their home environments. Analyses in this section are taken from multivariate regression models that control for children’s age, gender, and account for families clustered within villages.

Within the intervention group, results displayed that there were no significant differences in the gains made by children from wealthier and poorer families, and no difference between the gains made by children from more and less educated parents. There were also no differences in learning gains made by boys and girls. This suggests that all families and children were able to benefit equally from the C4CD Plus program.

Similar to previous studies of home learning environments and children’s development in Bhutan, results from this study found that children with access to more learning materials and who experienced more learning and play activities with their caregivers made significantly stronger learning and development gains than those with fewer materials and activities. These finds align with previous research which has found that strong support for cognitive development at home is an important driver of children’s early learning (Figure 19).

Figure 19: Learning and development skills associated with home learning environment factors (materials and activities)



Finally, there were results with implications for child protection and health. Analyses of learning gains across both study groups found that children who were reported to do chores in and outside their homes made significantly weaker gains than children who were not responsible for doing chores. In addition, children who weighed more and had

more diversity in their diets gained more than children who were lower weight and those with less food diversity. These findings suggest that in addition to strong home learning environments, children require protection from carrying out too much work at a young age, as well as proper nutrition in order to achieve optimal development (Figure 20 & 21).

Figure 20: Learning and development skills associated with child doing chores/work

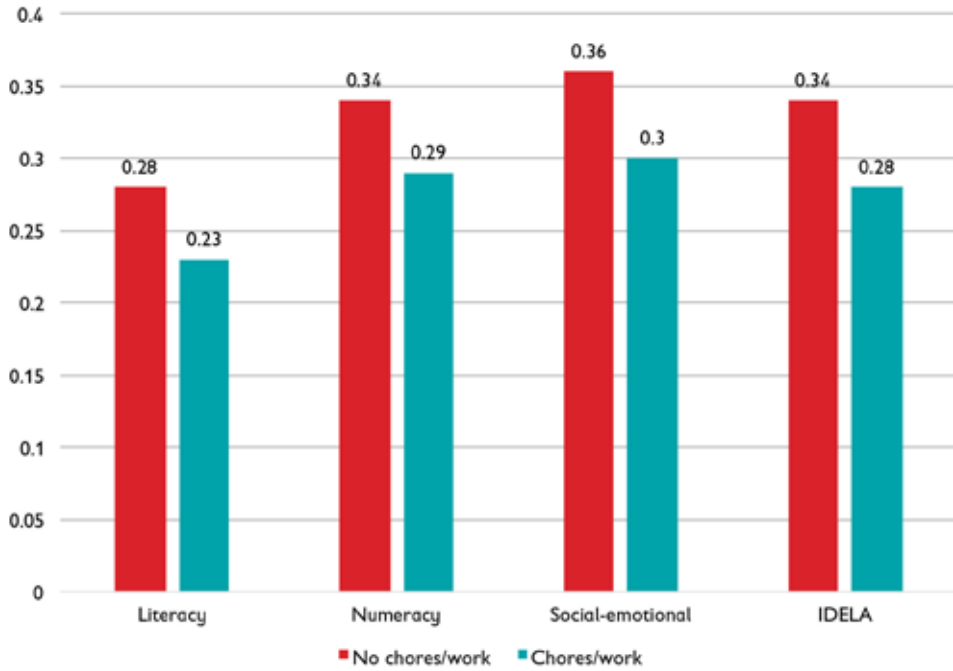
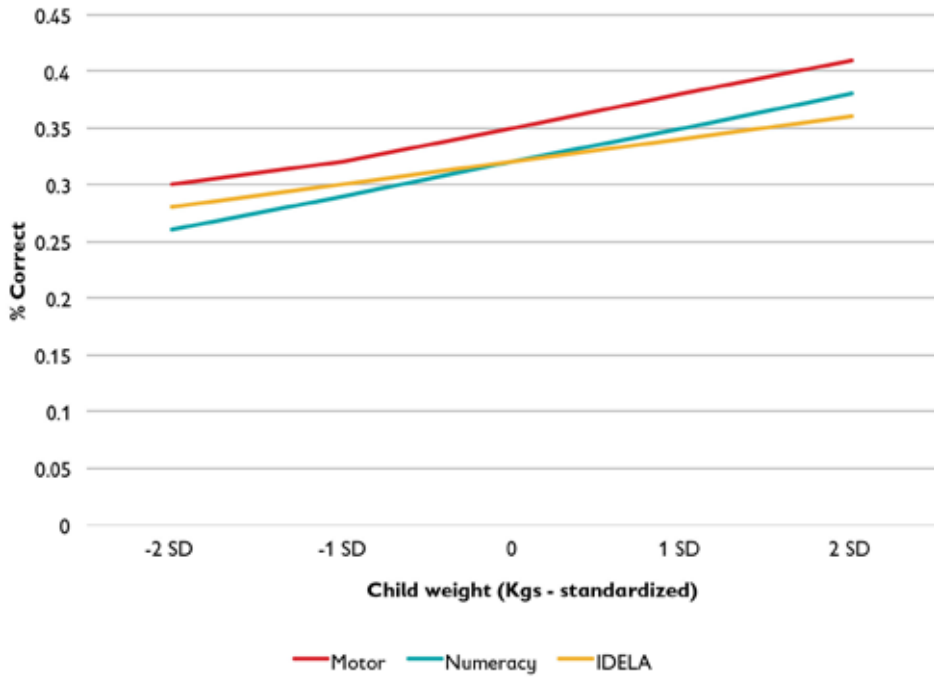


Figure 21: Learning and development skills associated with child weight



### 3.5. Conclusion

The results from impact evaluation of C4CD plus pilot project underpins the efficacy of a parenting program on helping children build foundational skills through simple home based activities in preparing them for school. Results from the quantitative analyses showed that children whose parents who attended the C4CD plus group displayed increased learning and developmental skills as compared to children whose parents did not have access to such a program. Over the course of the program period children from the intervention group significantly gained across all the six domains but especially achieved statistically significant gains in numeracy and literacy and overall IDELA score as compared to children from the control group.

The evaluation revealed no gender differences in children's skills acquisition but children from older age cohort performed better as compared to children from the younger age cohort.

Caregiving practices in the intervention group captured through the parent caregiver questionnaire found out increased home learning activities with children relating to reading, playing and improved access to reading resources.

Additional findings to look at the equity analysis revealed that there were no significant differences in the gains made by children from wealthier and poorer families, and no difference between the gains made by children from more and less educated parents. There were also no differences in learning gains made by boys and girls. This suggests that all families and children were able to benefit equally from the C4CD Plus program.

### 3.6. Policy relevance

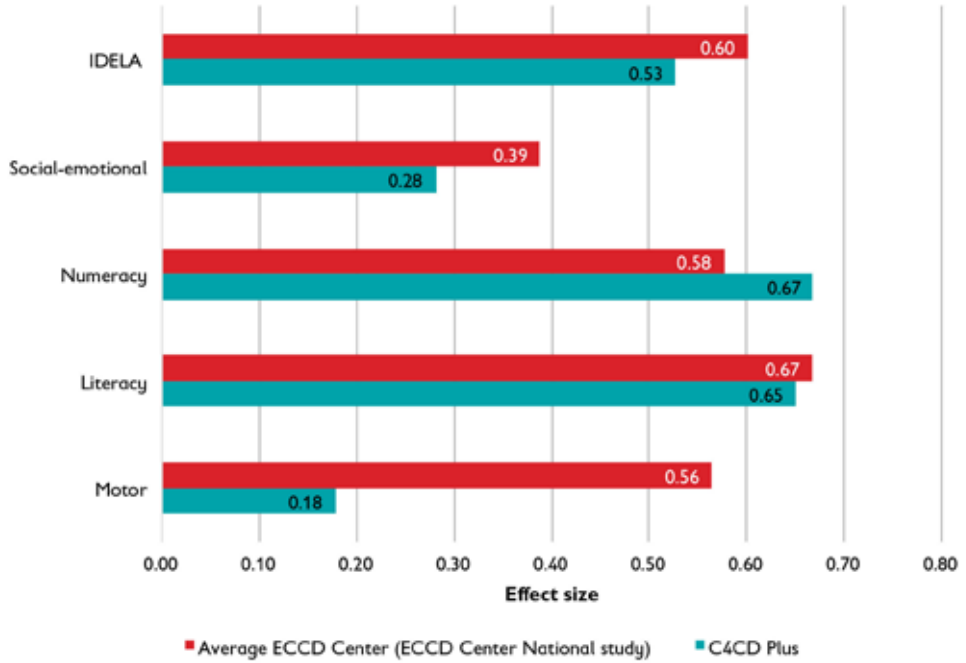
In order to determine how the learning gains related to the C4CD Plus program compared to other ECCD programs in the country, results were compared to the National ECCD study conducted in 2015.<sup>19</sup> Results from this impact evaluation demonstrate comparable gains in children learning and development similar to the national ECCD study completed in 2015.

The findings therefore suggest the potential of such a program to improve equitable access to ECCD services in the country. The C4CD Plus model is effective for children and also financially efficient. The Ministries of Health and Education should consider ways to expand the C4CD Plus program to other rural communities where ECCD center services are not currently available (Figure 22).

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19 Pisani, L., Dyenka, K., Sharma, P., Chhetri, N., Dang, S., Gayleg, K., & Wangdi, C. (2017). Bhutan's national ECCD impact evaluation: local, national, and global perspectives. *Early Child Development and Care*, 4430(March), 1–18. <https://doi.org/10.1080/03004430.2017.1302944>

Figure 22: Magnitude of learning and development gains (IDELA) from C4CD Plus and ECCD Center programs



Appendix A.  
Table A.1. Regressions results

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Social- emotional	(5) Culture	(6) Health & Hygiene	(7) IDELA (Bhutan)
Intervention	0.0471 (0.0410)	0.118*** (0.0239)	0.0974*** (0.0254)	0.0596 (0.0376)	0.0571 (0.0338)	0.0269 (0.0406)	0.0799** (0.0251)
Child age (months)	0.00740*** (0.00154)	0.00233* (0.000897)	0.00300*** (0.00108)	0.00186 (0.00179)	0.00623*** (0.00159)	0.00578*** (0.00133)	0.00262* (0.00115)
Child is female	0.0149 (0.0282)	0.0105 (0.0180)	-0.00405 (0.0123)	0.0350 (0.0211)	0.0481 (0.0331)	0.0540 (0.0264)	0.00851 (0.0132)
Motor (baseline)	0.614*** (0.0977)						
Literacy (baseline)		0.984*** (0.101)					
Numeracy (baseline)			0.486*** (0.118)				
Social-emotional (baseline)				0.531*** (0.0889)			
Culture (baseline)					0.386*** (0.0823)		
Health & Hygiene (baseline)						0.417*** (0.0911)	







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February 7, 2017

### SURVEY CLEARANCE

This is to state that Save the Children in-collaboration with Ministry of Health will be conducting a survey on “**Care For Child Development Plus (C4CD Plus)**”. The survey will be conducted in March 2017 and follow up end line survey will be conducted between June to November 2017 after the program implementation is over. The study methodologies and questionnaires were submitted to the NSB and it was reviewed by the survey clearance committee of the office. In this regard, the clearance committee is pleased to clear the conduct of the above mentioned survey.

We wish the survey team Good Luck!

**(Officiating Director General)**  
Survey & Data Processing Division





**Department of Public Health**  
Ministry of Health



**Save the Children**  
Bhutan Country Office