



*Agdal Nuhanović, Save the Children*

# Bosnia HEART Evaluation

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## EXECUTIVE SUMMARY

HEART, which stands for Healing and Education Through the Arts, is an arts-based approach to providing psychosocial support for children affected by serious or chronic stress. It uses the arts to help children process and communicate feelings related to their experiences. In May 2014, Bosnia and Herzegovina began using HEART programming in child friendly spaces (CFS) constructed to respond to children affected by severe and devastating floods and landslides. Following the emergency response, HEART elements were integrated in other project activities, primarily trainings for ECCD professionals. The primary purpose of the study is to generate evidence about how the HEART program contributes to children's early learning and development, especially related to social-emotional development.

This study is a quasi-experimental impact evaluation of both full year and 3-month HEART programming in Tuzla Canton, Bosnia and Herzegovina. Three-month ECCD programs are being tested as an alternative to full year preschool programs in areas where there are not enough resources to accommodate all children in a full year program. A baseline assessment of 420 children's learning and development was undertaken in April 2016, which is in the second half of the formal school year but the beginning of a 3-month compulsory preschool education program. A follow up assessment with the same children occurred at the end of the school year (for both full year and 3-month programs) in June 2016, plus a comparison group of 50 children with no access to ECCD programming were added at this time. To collect information about children's backgrounds and their social emotional wellbeing, the Social and Emotional Assets and Resiliency Scale for Preschool (SEARS-PRE) and caregiver questionnaire were used with parents. In addition, the International Development and Early Learning Assessment (IDELA) was used with children to assess their motor, literacy, numeracy and social-emotional skills.

Results of multivariate logistic regression analyses find that children who were enrolled in full year ECCD classes were significantly more likely to have parents who were more educated, and live in homes with fewer children, more storybooks and more relative wealth. In addition, information gathered from caregivers suggests that children not enrolled in an ECCD program are at a significant disadvantage in terms of the richness of learning materials and activities available to them at home compared to children who are enrolled in an ECCD program. Thus this study suggests that children from more disadvantaged families have a substantial deficit in their preparation for primary school. Not only are they less likely to have access to a full year ECCD program, they are also experiencing weaker home learning environments than their more advantaged peers.

An analysis of children's learning and development skills at the end of the school year found differences in children's skills related to their ECCD exposure, but no effect of the HEART program. At the point when this study began, children enrolled in a full year preschool program had significantly stronger learning and development skills in all areas compared to children beginning the 3-month programs. Similarly, at the end of the preschool year, children who attended a full year of ECCD had significantly stronger skills in all areas compared to children who attended the 3-month program and those who did not attend any ECCD program, even after controlling for baseline scores and relevant background

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factors. The largest gap in skills between children enrolled in a full-year ECCD program and those without access to ECCD was in the emergent math domain (17 points), followed by literacy (15 points), social-emotional development (13 points), and fine motor development (10 points). At the end of the school year children who attended the 3-month program had significantly stronger social-emotional skills and scored significantly higher on the overall IDELA score than children who did not attend ECCD at all. There were no positive significant relationships between enrollment in a HEART program and learning and development in any domain.

Analyses incorporating information from the caregiver interviews found that mother's education was significantly positively related to IDELA scores in all domains except motor development. After controlling for mother's education, no significant relationship between the number of children in the home, socioeconomic status or home learning environment (materials and activities) and IDELA scores was found. However, parents' reports of their children's social emotional assets (SEARS-PRE scores) at endline were significantly positively related to IDELA endline scores in all domains except emergent numeracy.

## Contents

Executive summary .....	2
Overview .....	5
Methodology .....	7
Caregiver Results.....	12
Learning and Development Results .....	16
Detailed Learning Results .....	20
Conclusions and next steps.....	25
Appendix A – Regression tables .....	27
Appendix B – Internal consistency .....	31

## OVERVIEW

### **Background**

HEART, which stands for Healing and Education Through the Arts, is an arts-based approach to providing psychosocial support for children affected by serious or chronic stress. It uses the arts to help children process and communicate feelings related to their experiences. The healing process begins when a child shares his or her memories and feelings, either verbally or through artistic expression, with a trusted adult who shows the child compassion and listens in a nonjudgmental way. The end result is a child who feels less isolated, more connected to their peers, and safe amidst the trusted adults in their lives, and the larger community. This in turn can lead to a more confident and secure child, leaving each child more capable, and more likely to learn. In addition to using arts for healing, HEART also uses arts-based creative learning methods to make education more interactive and fun in math, vocabulary, literacy, history, and other subject areas. Along with arts for healing and arts for learning, HEART also uses the arts for fun, to create entertaining and engaging activities and to introduce children to local cultural arts traditions.

In May 2014 Bosnia and Herzegovina was affected with the greatest rainfalls in the last hundred years, which caused severe and devastating floods and landslides. As a part of the emergency response, Save the Children established a total of 16 child friendly spaces (CFS) in Bosnia and Herzegovina CFS provided children, who experienced stress and trauma due to destruction or loss of their home, schools or family members, with safe and welcoming places where they received psychological support and help, and were able to continue their education and school activities that were disrupted by the floods. The HEART program was envisioned and implemented in order to enhance capacities of the CFS staff to deal with the traumas and stress children experienced and provide them with skills and tools to help the children get over the negative experiences and feelings caused by the natural disasters i.e. floods.

Furthermore, HEART elements were integrated in other project activities, primarily trainings for ECCD professionals. Beside series of trainings for pre-school and primary teachers of lower level education organized in Tuzla Canton that included 68 participants and replication trainings for 70 teachers of the Bosnian/Croatia/Serbian language in Tuzla Canton, trainings were organized for professionals, such as pedagogues, teachers, social workers, or facilitators from the Drop-in Centres from Banja Luka, Bijeljina, and Brcko Gradiška, Mostar Una-Sana Canton.

After finalization of trainings, HEART sessions were realized by primary and pre-schools teachers with children age four up to fourteen. During the first two years of piloting HEART in Bosnia Herzegovina, incredible success has been seen in the integration of HEART into classrooms and community centers. Teachers report that classrooms are becoming more creative, interactive, and fun. They also report that they feel increasingly confident in their ability to respond to the emotional needs of children and that they themselves, as adults, have found, through HEART, a way to process their own stress in a positive way. Ministry of Education, Science, Culture and Sport of Tuzla Canton has engaged the Pedagogical Institute to partner with Save the Children to support the integration of HEART into schools. It is important to emphasize that application of HEART was realized not just as extra – curricular activity but also during performance of regular school curricula, for example in Bosnian/Croatian/Serbian language and literature, Math classes, etc. Furthermore, HEART activities were implemented in 7 different ECCD units as a part of the compulsory preschool program

#### **ECCD program in Tuzla Canton (Bosnia and Herzegovina)**

Although in Tuzla Canton the Law has prescribed access for all children of preschool age (5.5-6) to a compulsory program of preschool education since school year 2010/2011, there was a very small percentage of children actually enrolled in the compulsory program due to the fact that the cantonal and local government lacked financial means and adequate infrastructure. In the three year period from 2013 to 2015 Save the Children established 113 ECCD learning sites as well as 4 ECCD Centres in Tuzla Canton in areas without preschool infrastructure. As a result, four-partite MoUs (SCiNWB, MoESCS, Pedagogical Institute and 12 Municipalities and City of Tuzla in Tuzla Canton) signed in December 2014, and extensive follow-up activities, Save the Children and partners (*Pedagogical Institute and MoE of Tuzla Canton*) succeeded to lobby municipal policy and decision makers to secure funds for salary coverage and maintenance costs for realization of compulsory 3 months program. As a result of the project, 12 municipalities and City of Tuzla in Tuzla Canton allocated and opened budget lines in municipal budgets for a confirmed minimum amount of 125000 EUR per year to support implementation of Compulsory Preschool/Pre-primary program prior to entering to Primary Education for children of age 5. Full implementation of the compulsory preschool program prior entering primary education was achieved in school year 2014/2015, in great extent thanks to project activities of Save the Children in Tuzla Canton that made large contribution to accessible and quality early childhood care and development. Among other contributions above mentioned and according to data of the Pedagogical Institute of Tuzla Canton, Save the Children contributed to 4,318 or 99.8% of all children to be enrolled into compulsory preschool education in Tuzla Canton in first half of 2015, compared to 20% which was recorded in 2012 before the project started.

#### **Purpose of study**

The primary purpose of the study is to generate evidence about how the HEART program contributes to children's early learning and development, especially related to social-emotional development. This

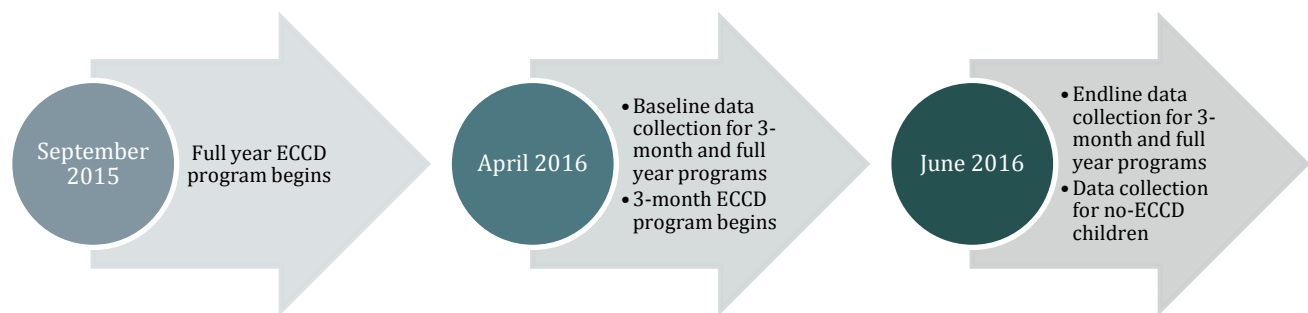
evidence can be used to advocate for greater investment and expansion of HEART programming, and also for further program development and improvement.

## METHODOLOGY

### Study design

This study is a quasi-experimental impact evaluation of both full year and 3-month HEART programming in Tuzla Canton, Bosnia and Herzegovina. Three-month ECCD programs are being tested as an alternative to full year preschool programs in areas where there are not enough resources to accommodate all children in a full year program. A baseline assessment of children’s learning and development was undertaken in April 2016, which is the second half of the formal school year and the beginning of a 3-month compulsory preschool education program. A follow up assessment with the same children occurred at the end of the school year (for both full year and 3-month programs) in June 2016, and a comparison group of children with no access to ECCD programming were added at this time.

Figure 1. Project and study timeline



The International Development and Early Learning Assessment (IDELA) was used to measure children’s learning and development across four core domains (Motor, Literacy, Numeracy, and Social-emotional) and included three additional social-emotional items to IDELA’s existing five in an effort to more fully capture the HEART program’s focus on social-emotional development. A caregiver questionnaire was used to gather information about parenting practices and home environments. In addition, parents answered questions from an adapted version of the Social-Emotional Assets and Resiliency Scale for Preschool (SEARS-PRE)<sup>1</sup> in order to gather more information about children’s social-emotional wellbeing. The same tools were used at baseline and endline.

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<sup>1</sup>Ravitch, N.K. (2013). Development and Preliminary Validation of the Social and Emotional Assets and Resiliency Scale for Preschool (Doctoral Dissertation). Retrieved from: <https://scholarsbank.uoregon.edu/xmlui/handle/1794/13409>

The research questions for this study were:

1. What is the impact of a full year of HEART supported preschool compared to a year of standard preschool on children's learning and development, especially related to social-emotional development?
2. What is the impact of a 3-month HEART supported preschool program compared to 3 month ECCD on children's learning and development, especially related to social-emotional development?
3. What is the difference in learning and development between children who attended a full year of preschool compared to a 3-month program or no ECCD at all?

### **Sampling**

Schools and teachers designated to receive HEART training were chosen before the study began and therefore assignment to treatment was not random. A group of seven classrooms previously trained on HEART methodologies were chosen for the 'Full year: HEART' study group, and another group of nearby classrooms with teachers who had not been trained on HEART were chosen for the 'Full year: Regular' comparison group. Similarly a group of seven classrooms that served children receiving the 3-month ECCD with teachers trained in the HEART methodologies were chosen for the '3-month: HEART' study group, and a group of classrooms holding three-month preschool classes were chosen for the '3 month: Regular' comparison group.

There were two main stages followed for the sample selection procedure for selecting ECCD classrooms and centers and children for this study. The first stage focused on the selection of ECCD classrooms for the study. The sample was selected at the level of Tuzla Canton and geographic domains were equally represented in sample (Tuzla, Živinice, Banovići, Srebrenik, Gradačac, Gračanica Lukavac and Srebrenik).

A total of 28 ECCD classrooms were randomly selected. Subsamples from the previous selected preschools were then selected for subsample analyses for the main study:

1. Seven classrooms in 3-month ECCD program,
2. Seven classrooms in Full year ECCD program,



3. Seven classrooms in 3-month HEART supported ECCD program,
4. Seven classrooms in Full year HEART supported ECCD program.

The second stage focused on the selection of children from the preschool classrooms. Each classroom was represented by a sample of 15 children. The target sample, which was determined based on total number of children in classrooms, was 420, plus an additional group of 50 children in Una Sana Canton (Bihac) who were not receiving any preschool programming added at the endline. In terms of sample selection, children selected from each center were randomly selected from the list provided by teachers (matched on one important background variable: between 5 and 6 years old). All children interviewed as baseline were included in the endline sample. **Fifteen percent of children interviewed at baseline were not found at the time of the endline assessment. However, there were no significant differences on measured variables found between children present and those absent at endline so no additional variables are used to control for attrition bias in subsequent analyses of children’s learning gains.** A breakdown of the children interviewed in the baseline and endline data collections is shown in Table I.

Table I. Study sample

Study Group	Planned	Baseline & Endline	Missing at Endline (Baseline only)	New at Endline
<b>Full year: HEART</b>	105	82	21	0
<b>Full year: Regular</b>	105	90	15	0
<b>3 months: HEART</b>	105	91	14	0
<b>3 months: Regular</b>	105	91	14	0
<b>No ECD</b>	50	0	0	49
<b>Total</b>	470	354	64	49

## Tools

For baseline data collection, the International Development and Early Learning Assessment (IDELA) tool was used to measure children development and learning. The standard IDELA child assessment contains 22 questions in four domains: motor development, emergent literacy, emergent numeracy and social-emotional development. For this assessment, 3 additional social-emotional items were added and one gross motor item was dropped. In addition, some items were revised slightly and a free drawing items was added at the end of the assessment. This IDELA tool also contains assessor-rated questions related to children’s approaches to learning and one item focused on short-term memory. See

Appendix B for more details on the internal consistency of the IDELA and SEARS-PRE tools used in this study.

Table 2. IDELA Domains and Skills

<b>Gross and Fine Motor Development</b>	<b>Emergent Literacy and Language</b>	<b>Emergent Numeracy</b>	<b>Social-emotional Development</b>	<b>Executive function</b>
Copying a shape	Print awareness	Measurement and comparison	Peer relations	Short-term memory
Drawing a human figure	Expressive vocabulary	Classification/ Sorting	Emotional awareness	
Folding Paper	Letter identification	Number identification	Empathy	
	Emergent writing	Shape identification	Conflict resolution	
	Initial sound discrimination	One-to-one correspondence	Self-awareness	
	Listening comprehension	Simple operations	Self-confidence*	
		Problem solving	Personal preference*	
			Free drawing*	

Note: Items marked with a star are HEART additions to the standard IDELA tool.

The IDELA caregiver questionnaire and SEARS-PRE tools were used with parents. The IDELA caregiver questionnaire contains items related to parent characteristics, family conditions and the home learning environment. The SEARS-PRE assessment was adapted from the original work of N. Ravitch of the University of Oregon and contains 24 items related to the social-emotional assets that children possess.

Table 3. IDELA Caregiver Questionnaire

Section	Description
1. <b>General family information</b>	Sex of child, child age, number of children at home, parental literacy, parental education, languages spoken at home
2. <b>ECCD experience and educational expectations</b>	Child participation in ECCD programs, details of participation, parental expectation and aspirations of child's educational attainment
3. <b>Access to early learning materials and resources at home</b>	Types of reading materials at home, types of toys at home
4. <b>Parenting practices and support for learning and development</b>	Adults in the home engaging with children to promote learning and development
5. <b>Inadequate care</b>	Children left alone or in the care of another young child
6. <b>Caregiver self-efficacy</b>	Attitudes about parent's role in child's development
7. <b>Socioeconomic status</b>	Housing materials, objects/appliances owned, land/animals owned

### Data collection

Fourteen university graduates with previous data collection experience were hired for the baseline data collection. These enumerators underwent five days of intensive training which included review of all baseline tools, practice using the tools with children and adults, techniques for interviewing young children, procedures for random selection of classrooms and children, getting consent from children and adults, ethical considerations and Child Safeguarding Policy. Field coordinator and coordinator from Pedagogical institute of Tuzla Canton were hired as well and they attended the same training. The training was supported through detailed presentations of the survey tools/instruments, role playing, actual practice in using the tool and discussions. The training was facilitated by a SCUS Research Team member and supported by Save the Children in North West Balkans (Hereinafter: SCINWB) MEAL Specialist and Program Officers.

### Ethical considerations

This evaluation received the study approval from the SCUS Ethics Review Committee (ERC). Enumerators were trained on Ethical Standards, Child Safeguarding Policy and on taking the consent from children and adults who contributed to the data collection. Official letters were sent to Ministry

of Education, Science, Culture and Sport of the Tuzla Canton, Pedagogical Institute of the Tuzla Canton and all preschools in the sample seeking permission to collect data in their classrooms. This research received official study approval by Ministry of Education, Science, Culture and Sport of the Tuzla Canton.

### **Data processing and analysis**

The data were collected using Tangerine software ([www.tangerincentral.org](http://www.tangerincentral.org)) so no manual data entry was required. The Tangerine account housing the data can be accessed by an SCUS Research Team member and SCINWB MEAL Specialist and will be deleted after endline analysis. Children's drawings were uploaded to a secure Google Drive account managed by the SCINWB MEAL Specialist and did not contain any identifying information.

Data analysis will include the comparability of children in the different study groups through a comparison of means through ANOVA and regression analyses with clustered standard errors to account for the grouping of student-level data within schools. Summary statistics, accompanied by clustered t-tests, will be used to analyze children's performance in each of the learning and development sub-tests. Finally, we will look to multivariate regression models to explore relationships between learning and development skills and student background characteristics, school environment, and home learning environment.

### **Limitations**

Due to program history in Bosnia and Herzegovina and implementation needs, study groups were not randomly assigned and study groups are relatively small, limiting the possible extrapolation of findings beyond the study sample. In addition, no baseline measure was taken for children without access to ECCD so it is not possible to measure learning growth for all study groups. Therefore, the relationships discussed in this report are strictly correlational and causal inferences cannot be made. Finally, the SEARS-PRE is not a validated international assessment of social-emotional wellbeing for young children.

## **CAREGIVER RESULTS**

### **Family characteristics**

The caregiver questionnaire asked about the children and parents included in the study. Children in the sample are 5.6 – 6 years old, on average, and about half of the children in all study groups are girls with the exception of the No ECCD group which contains 69 percent girls. **Children in the full year HEART program were significantly younger than children in the other groups, on average.**

Seventy-one percent of parents responding were mothers, 16 percent were fathers and the 13 percent were other caregivers. The majority of mothers and fathers had completed secondary education. In addition, 32 percent of mothers and 27 percent of fathers had completed a higher education degree. **Mothers and fathers of children in the full year programs had significantly higher levels of education than mothers of children in the 3 month programs and children not attending an ECCD program, on average. Also, there were significantly more children in the household for children not attending an ECCD program compared to children enrolled in a full year program.**

Table 4. Family characteristics

	Full year: HEART	Full year: Regular	3 months: HEART	3 months: Regular	No ECCD
Child is female	51%	54%	49%	49%	69%
Child age	5.6	5.9	6.0	6.0	5.8
<b>Caregiver relation to child</b>					
Mother	69%	69%	74%	65%	80%
Father	16%	20%	17%	13%	14%
Grandparent	14%	7%	6%	13%	2%
Brother/sister	1%	1%	0%	0%	2%
Other caregiver	0%	2%	3%	10%	2%
<b>Mother education</b>					
None	0%	0%	0%	2%	0%
Primary	1%	1%	17%	17%	16%
Secondary	57%	44%	63%	75%	65%
Higher education	42%	55%	20%	6%	18%
<b>Father education</b>					
None	0%	0%	3%	0%	0%
Primary	0%	0%	17%	11%	10%
Secondary	62%	55%	66%	84%	71%
Higher education	38%	45%	14%	5%	18%
No. children in family	1.7	1.7	1.8	1.8	2.1

### Home learning environment

The caregiver questionnaire also asks parents detailed questions about the home learning environment in which children are living. **Children in the compulsory 3 month ECCD program and those not enrolled in a preschool program had significantly fewer storybooks at home**

compared to children in the full year programs. Also, children not attending a preschool program had significantly fewer toys at home than children in the full year programs.

Table 5. Average home learning materials

	Full year: HEART	Full year: Regular	3 months: HEART	3 months: compulsory	No ECCD
<b>No. types of reading material</b>	5.1	5.2	5.0	4.9	4.7
<b>Storybooks</b>	97%	100%	100%	95%	90%
<b>No. storybooks</b>	9.4	9.3	8.2	7.6	7.4
<b>Textbooks</b>	84%	79%	71%	78%	74%
<b>Magazines</b>	78%	84%	77%	76%	67%
<b>Newspapers</b>	80%	81%	74%	70%	67%
<b>Religious books</b>	69%	72%	86%	73%	84%
<b>Coloring books</b>	100%	100%	94%	98%	90%
<b>No. types of toys</b>	7.9	8.0	7.7	7.7	7.2
<b>Homemade toys</b>	66%	69%	66%	60%	53%
<b>Store-bought toys</b>	100%	99%	100%	97%	98%
<b>Household objects</b>	68%	61%	57%	57%	61%
<b>Outside objects</b>	87%	94%	86%	91%	71%
<b>Drawing/writing</b>	99%	100%	100%	100%	100%
<b>Puzzles</b>	99%	98%	94%	92%	88%
<b>Hand-eye coordination</b>	95%	100%	94%	98%	92%
<b>Colors/shapes/sizes</b>	96%	98%	94%	92%	86%
<b>Other</b>	88%	85%	80%	86%	71%

In terms of home learning activities, the most commonly reported activities were taking children outside and playing with them. The least common activities were singing and drawing with children. On average, caregivers reported doing 7.1 – 8.2 activities out of 9 with their children every week which suggests quite rich home learning activities for children in this area. **Parents of children not enrolled in ECCD tended to report engaging in fewer home learning activities but only significantly fewer than parents in the 3-month HEART group, who reported the most activities.**

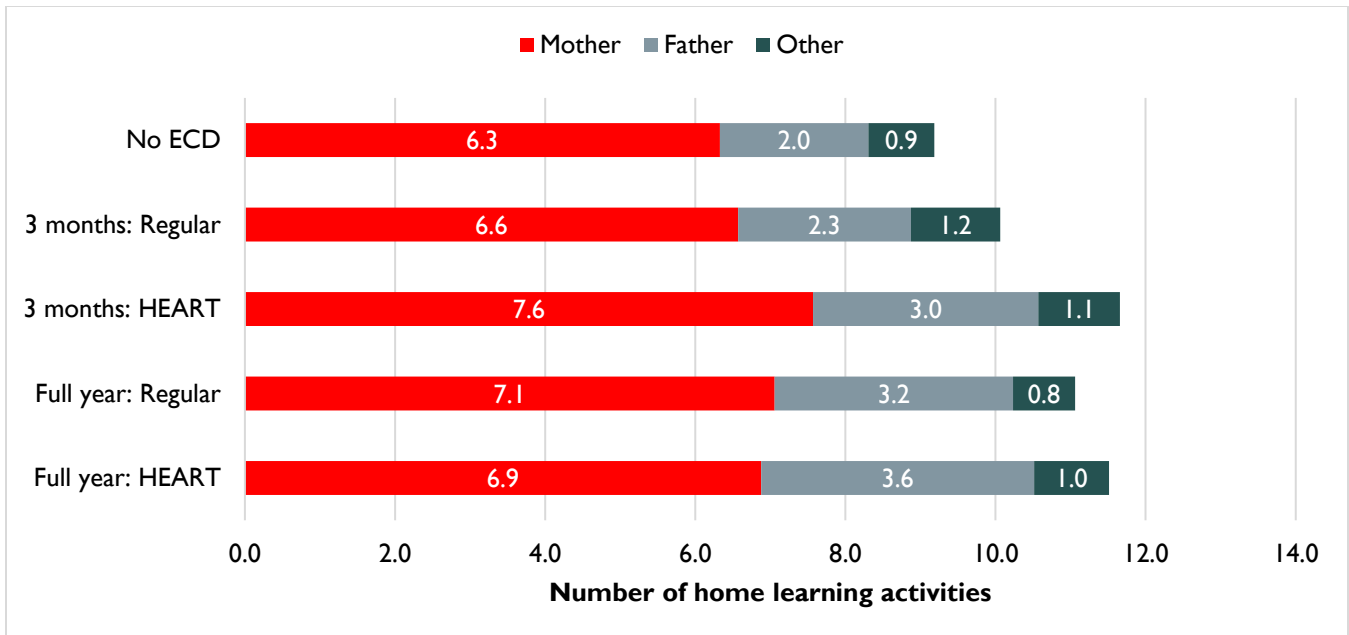
Mothers reported engaging in about twice as many activities with children compared to fathers (6.7 compared to 3.5 on average). **Fathers in the full year HEART program were reported to**

**engage in significantly more home learning activities with their children compared to fathers of children who were not enrolled in an ECCD program.** Taken together, this information suggests that children not enrolled in an ECCD program are at a significant disadvantage in terms of the richness of learning materials and activities available to them at home compared to children who are enrolled in an ECCD program. This is especially important given that these children do not have access to learning opportunities through a center-based program and therefore home stimulation is all they have to prepare them for primary school.

Table 6. Average home learning activities

	<b>Full year: HEART</b>	<b>Full year: Regular</b>	<b>3 months: HEART</b>	<b>3 months: Compulsory</b>	<b>No ECCD</b>
<b>No. home learning activities (out of 9)</b>	7.6	7.7	8.2	7.6	7.1
<b>Reading</b>	81%	85%	86%	79%	65%
<b>Telling stories</b>	92%	92%	91%	84%	80%
<b>Singing</b>	82%	78%	89%	71%	65%
<b>Taking outside</b>	100%	100%	97%	97%	100%
<b>Playing</b>	97%	97%	91%	91%	92%
<b>Drawing/naming objects</b>	80%	78%	97%	87%	78%
<b>Teaching</b>	91%	85%	83%	84%	80%
<b>Teaching letters</b>	66%	81%	94%	79%	71%
<b>Teaching numbers</b>	76%	80%	91%	84%	76%
<b>Mom: No. home learning activities</b>	6.9	7.1	7.6	6.6	6.3
<b>Dad: No. home learning activities</b>	3.6	3.2	3.0	2.3	2.0
<b>Other caregiver: No. home learning activities</b>	1.0	0.8	1.1	1.2	0.9

Figure 2. Home learning activities by caregiver and study group



## LEARNING AND DEVELOPMENT RESULTS

Analysis of information from the caregiver questionnaire, SEARS-PRE and IDELA tools together provides detailed information on the learning and development skills children in Tuzla Canton possess before they enter primary school. This study finds distinct differences related to children’s family background, their exposure to ECCD programs and their social emotional wellbeing. However, given the differences found between groups at baseline and the fact that children with no access to ECCD were only interviewed at endline, these relationships are only correlational and causal interpretations cannot be made.

### SEARS – PRE

Parents were also asked to respond to questions regarding their children’s social-emotional wellbeing and assets through the SEARS-PRE. Parents reported whether their children rarely (coded as 0), sometimes (coded as 1) or often (coded as 2) displayed the target skill or behavior. On average, children were rated most highly on the item about whether or not they were liked and accepted by other children and lowest on the ability to disagree with others without fighting.

At baseline, there were no significant differences between the social-emotional skills of children in different study groups. There were also no significant differences between gains made by children in different study groups or endline scores.



Table 7. Average SEARS-PRE scores by group

	Full year: HEART		Full year: Regular		3 months: HEART		3 months: Regular		No ECD
	Baseline	Gain	Baseline	Gain	Baseline	Gain	Baseline	Gain	Endline
<b>Total SEARS-PRE (out of 46)</b>	38.9	1.72	39.1	2.25	38.5	1.76	40.2	0.56	41.1
<b>Communication</b>									
Can express feelings/ emotions through words	1.77	0.00	1.77	0.07	1.77	-0.02	1.79	0.04	1.71
Uses words to solve problems	1.71	0.07	1.74	0.12	1.66	0.03	1.70	0.09	1.74
Uses clear communication when describing events	1.84	0.06	1.92	-0.02	1.79	-0.07	1.87	0.04	1.84
Tells adults how he/she feels	1.74	0.06	1.73	0.05	1.51	0.27	1.73	-0.04	1.67
Asks for help when necessary	1.89	0.03	1.89	0.06	1.88	-0.08	1.93	-0.09	1.92
Stands up for herself or himself	1.70	0.03	1.71	0.05	1.69	0.02	1.67	0.00	1.78
<b>Empathy/Relations with others</b>									
Helps others solve problems	1.59	0.17	1.71	-0.01	1.45	0.24	1.69	-0.01	1.80
Comforts other children who are upset	1.64	0.09	1.68	0.03	1.60	-0.03	1.71	0.06	1.74
Initiates play with others easily	1.85	0.12	1.86	0.07	1.92	0.08	1.91	-0.06	1.88
Is kind to others	1.85	0.06	1.88	0.04	1.89	-0.04	1.85	0.04	1.92
Shares toys and other belongings	1.56	0.06	1.56	0.21	1.72	0.14	1.75	0.06	1.71
Tries to understand how others feel when they are angry, upset, or sad	1.73	0.13	1.82	0.11	1.79	0.07	1.91	0.00	1.96
Smiles and laughs when playing with other children (or with adults)	1.84	0.04	1.86	0.02	1.78	0.05	1.83	0.09	1.90
Says nice things to others or celebrates other's accomplishments	1.67	0.13	1.58	0.24	1.69	-0.09	1.77	0.10	1.88

	Full year: HEART		Full year: Regular		3 months: HEART		3 months: Regular		No ECD
	Baseline	Gain	Baseline	Gain	Baseline	Gain	Baseline	Gain	Endline
<b>Responds appropriately to other people's facial expressions</b>	1.67	0.04	1.54	0.25	1.45	0.35	1.50	0.28	1.65
<b>Is accepted and liked by other children</b>	1.96	0.01	1.96	0.02	2.00	-0.03	1.89	0.06	1.96
<b>Regulation</b>									
<b>Calms down easily after being upset</b>	1.53	0.05	1.52	0.28	1.61	-0.10	1.66	-0.05	1.78
<b>Takes turns</b>	1.80	0.12	1.76	0.12	1.78	0.17	1.83	0.04	1.84
<b>Is interested and engaged in classroom activities</b>	1.86	0.06	1.83	0.09	1.75	0.13	1.83	0.01	1.86
<b>Remains calm in disappointing situations</b>	1.12	0.08	1.04	0.08	1.04	0.11	1.24	-0.11	1.35
<b>Shows responsibility for things around her/him</b>	1.56	0.15	1.56	0.02	1.64	0.14	1.80	0.03	1.94
<b>Disagrees with other people without fighting or arguing</b>	1.34	0.06	1.39	0.24	1.32	0.28	1.50	-0.04	1.61
<b>Adjusts well to new teachers or caregivers</b>	1.70	0.10	1.76	0.11	1.77	0.15	1.82	0.04	1.71

## Access

**Results of multivariate logistic regression analyses find that children who were enrolled in a full year ECCD classes were significantly more likely to have parents who were more educated, and live in homes with fewer children, more storybooks and more appliances.** This suggests that children from more advantaged families are more likely to have access to full year ECCD program, and more disadvantaged children are less likely to have access to these programs.

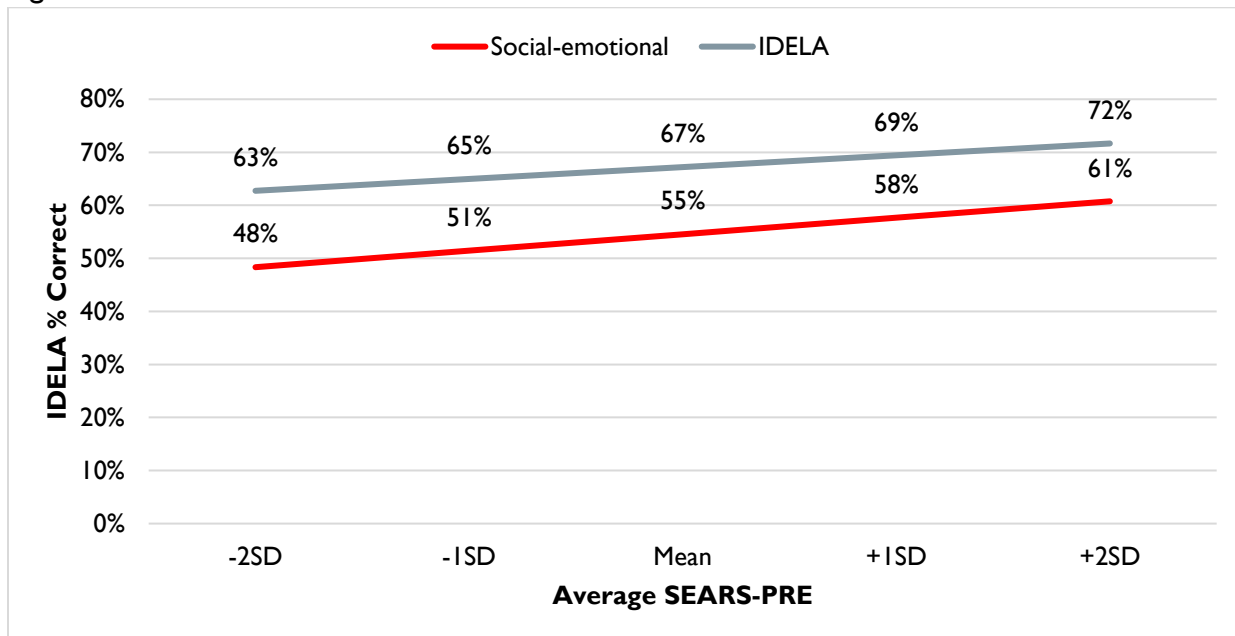
## Preparation for primary school

Analyses in this section focus on data collected at endline in order to incorporate all study groups and investigate children's preparation to begin primary school. **Looking at children's learning and development skills at the end of the school year, analyses found that older children have**

significantly stronger skills than younger children, and girls had stronger fine motor skills than boys.

Further, analyses incorporating information from the caregiver surveys found that mother’s education was significantly positively related to IDELA scores in all domains except motor development. **After controlling for mother’s education, no significant relationship between the number of children in the home, socioeconomic status or home learning environment (materials and activities) and IDELA scores was found. However, parents’ reports of their children’s social emotional assets (SEARS-PRE scores) at endline were significantly positively related to IDELA endline scores in all domains except emergent numeracy.**

Figure 3. Predicted endline SEARS-PRE and IDELA scores

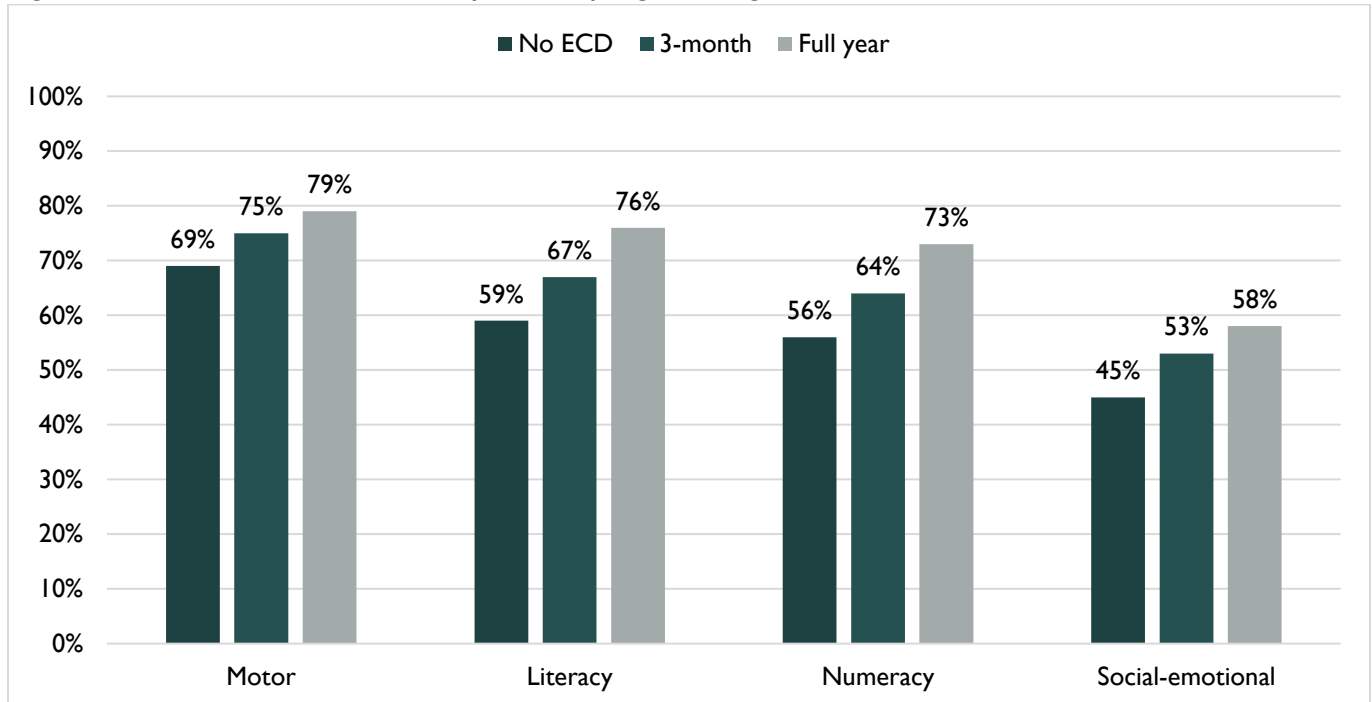


Note: Figure controls for age, gender, mothers’ education, HEART exposure and ECCD program length. SEARS-PRE score is cubed and standardized because the data were substantially skewed.

**At the point when this study began, children enrolled in a full year preschool program had significantly stronger learning and development skills in all areas compared to children beginning the 3-month programs. Similarly, at the end of the preschool year, children who attended a full year of ECCD had significantly stronger skills in all areas compared to children who attended the 3-month program and those who did not attend any ECCD program, even after controlling for baseline scores and relevant background factors. The largest gap in skills between children enrolled in a full-year ECCD program and those without access to ECCD was in the emergent math domain (17 points), followed by literacy (15 points), social-emotional development (13 points), and fine motor development (10 points). At the end of the school year children who attended the 3-month program had significantly stronger social-emotional skills and scored significantly higher on the overall IDELA score than children**

who did not attend ECCD at all. There were no positive significant relationships between enrollment in a HEART program and learning and development in any domain.

Figure 4. Predicted endline scores by ECCD program length



Note: Figure controls for age, gender, mothers' education, HEART exposure and SEAR-PRE score.

## DETAILED LEARNING RESULTS

Results in this section display the changes in children's learning and development from April 2016 – June 2016, as measured by IDELA. The proportion correct for each item is the average of the total number of correct responses divided by the total possible points for each child. To create domain scores, the proportion correct for each item in that domain are added together and then divided by the total number of items in the domain. The overall IDELA score is calculated by adding together the four core domain scores (motor development, literacy, numeracy and social-emotional development) and dividing by four.

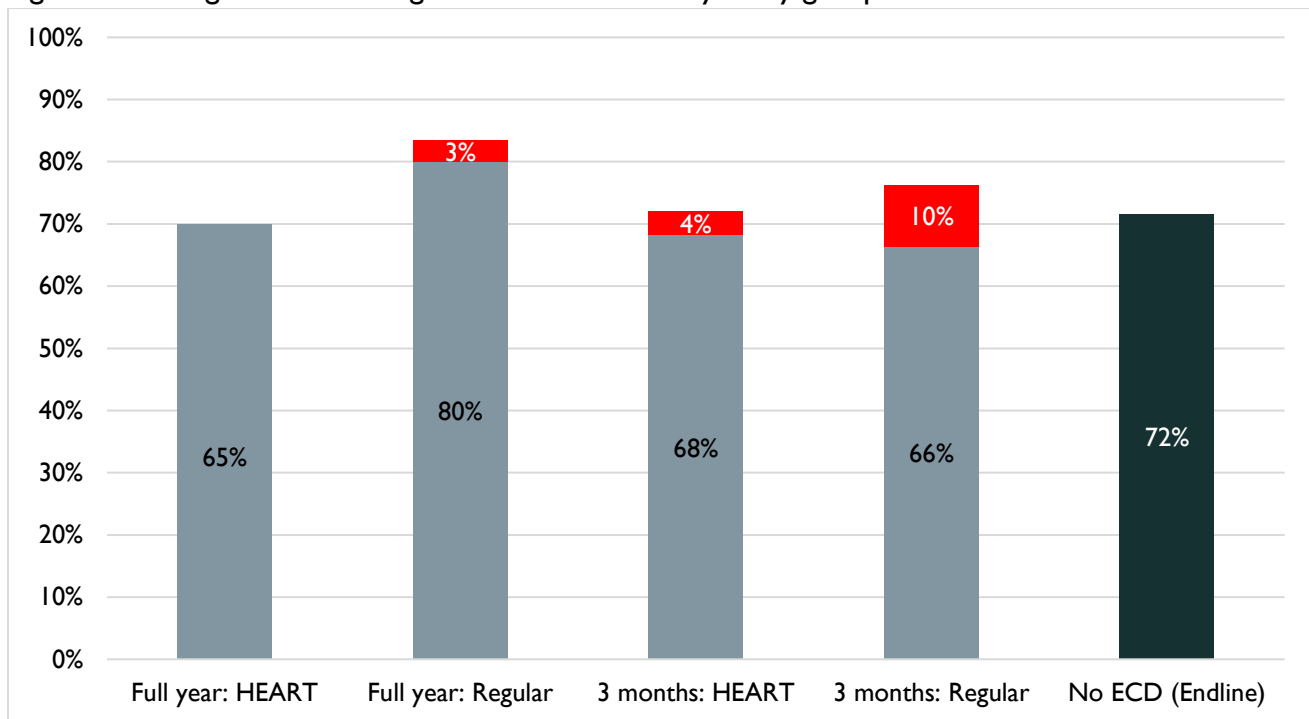
### Motor Development

The IDELA tool used for this evaluation included three fine motor items. On average, children made the strongest gains in copying a shape and weakest in folding. Children in the standard full year program made significantly stronger gains in paper folding than children in the full year HEART program. At the end of the school year, children displayed the strongest skills in copying a shape and the weakest in folding paper.

Table 8. Average fine motor skills

	Full year: HEART		Full year: Regular		Significant difference in gain?	3 months: HEART		3 months: Regular		Significant difference in gain?
	Baseline	Gain	Baseline	Gain		Baseline	Gain	Baseline	Gain	
Copy a shape	75%	10%	91%	4%		83%	4%	81%	12%	
Folding	49%	-2%	65%	8%	*	46%	1%	45%	8%	
Drawing a person	72%	6%	85%	-1%		76%	6%	74%	10%	
Total Fine Motor	65%	5%	80%	3%		68%	4%	66%	10%	

Figure 5. Average baseline and gain fine motor skills by study group

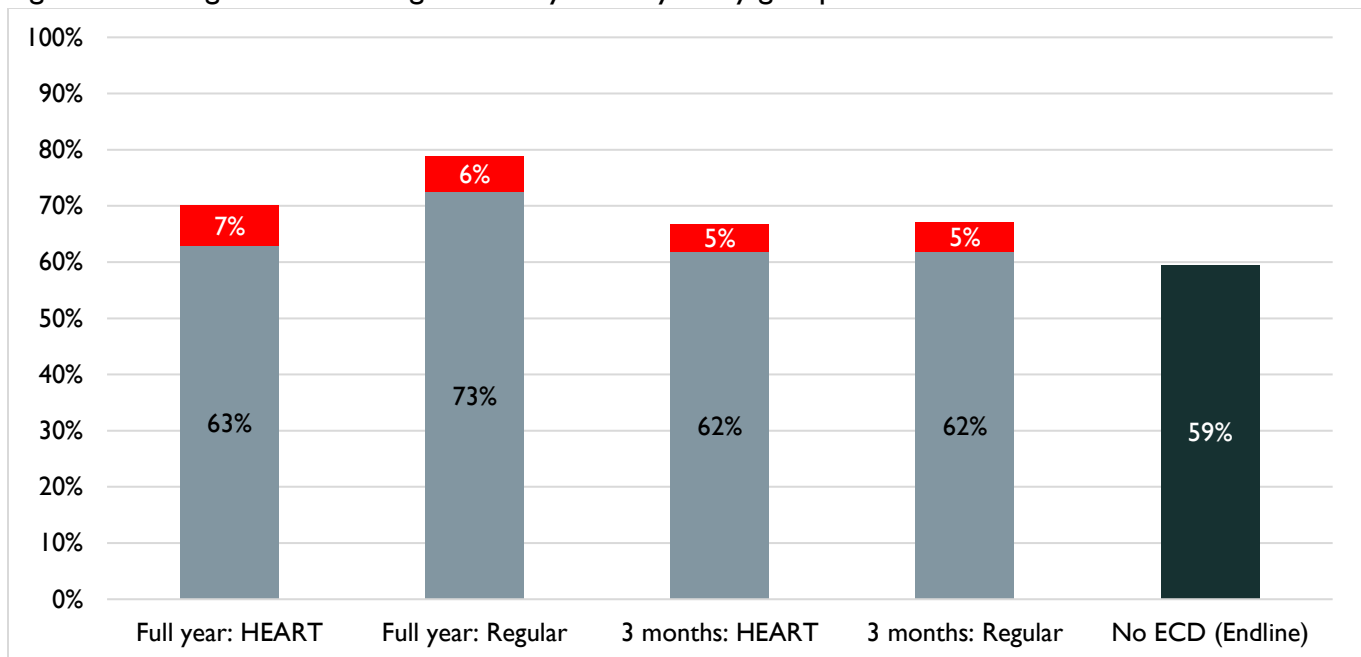


### Emergent Literacy

The IDELA tool included six literacy items. On average, children made the strongest gains in phonemic awareness (identifying first letter sounds) and the weakest in expressive vocabulary and oral comprehension. There were no significant differences in gains made by children on any item between children in the regular and HEART programs. At endline, children had the strongest skills in emergent writing and the weakest in phonemic awareness.

**Table 9. Average emergent literacy skills**

	Full year: HEART		Full year: Regular		Significant difference in gain?	3 months: HEART		3 months: Regular		Significant difference in gain?
	Baseline	Gain	Baseline	Gain		Baseline	Gain	Baseline	Gain	
Expressive vocabulary	38%	2%	43%	5%		34%	4%	36%	4%	
Print awareness	63%	13%	74%	13%		70%	3%	76%	-3%	
Letter identification	62%	5%	76%	4%		57%	3%	51%	6%	
Phonemic awareness	56%	15%	61%	12%		48%	12%	44%	12%	
Writing	80%	4%	96%	3%		86%	5%	86%	8%	
Oral comprehension	79%	5%	85%	2%		76%	3%	77%	5%	
Total Literacy	63%	7%	73%	6%		62%	5%	62%	5%	

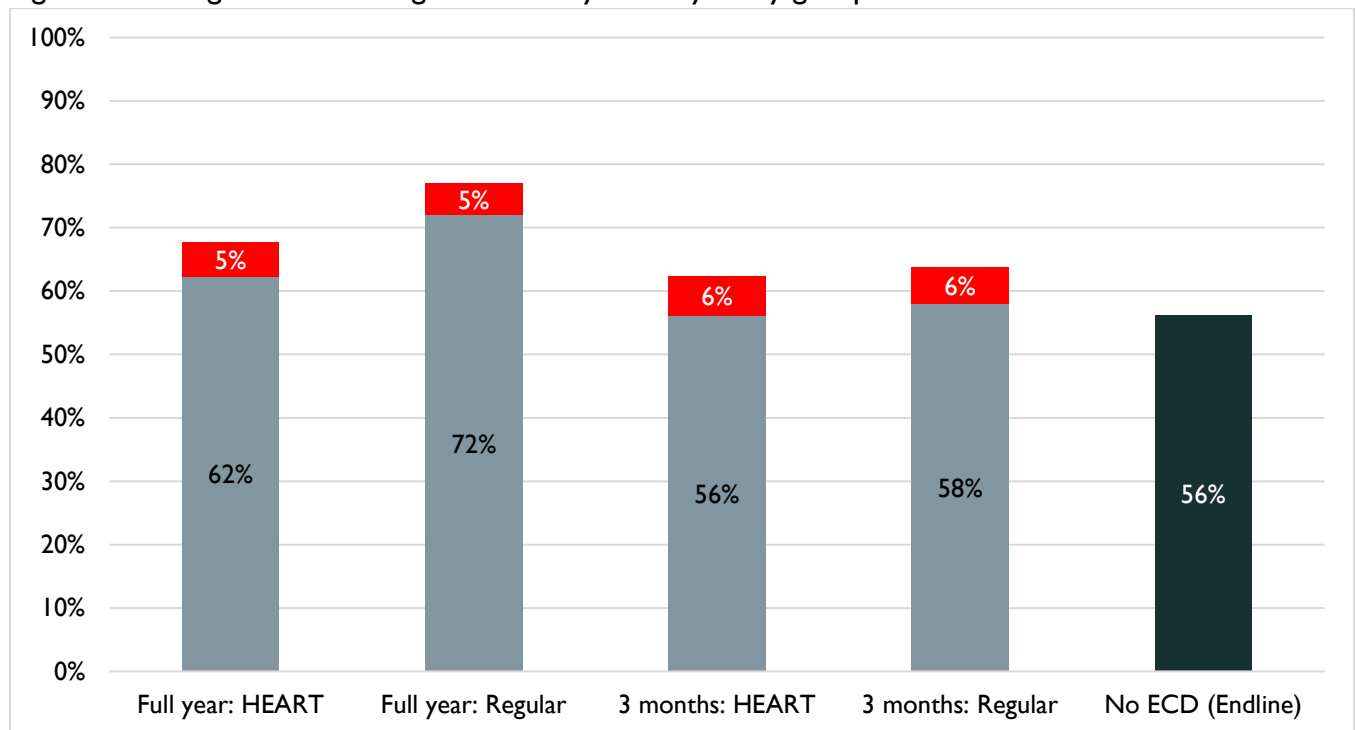
**Figure 6. Average baseline and gain literacy skills by study group**


### Emergent Numeracy

The IDELA tool included seven math items. On average, children made the strongest gains in sorting and the weakest in measurement and puzzle completion. Measurement scores were quite high to begin with but there is more room for improvement in puzzle completion. Children in the standard full year program made significantly stronger gains in shape identification than children in the full year HEART program. At the end of the school year children had the strongest skills in measurement and the weakest in sorting.

**Table 10. Average IDELA numeracy skills**

	Full year: HEART		Full year: Regular		Significant difference in gain?	3 months: HEART		3 months: Regular		Significant difference in gain?
	Baseline	Gain	Baseline	Gain		Baseline	Gain	Baseline	Gain	
Measurement	85%	2%	89%	-2%		87%	-2%	86%	1%	
Shape identification	53%	5%	59%	6%	*	48%	5%	51%	6%	
Sorting	37%	13%	49%	11%		28%	13%	32%	8%	
Number identification	61%	4%	70%	4%		48%	7%	49%	8%	
One-to-one correspondence	68%	2%	76%	9%		61%	5%	63%	5%	
Simple operations	65%	5%	73%	9%		60%	10%	64%	6%	
Puzzle	68%	7%	88%	-1%		61%	5%	61%	6%	
Total Emergent Math	62%	5%	72%	5%		56%	6%	58%	6%	

**Figure 7. Average baseline and gain numeracy skills by study group**


## Social-emotional Development

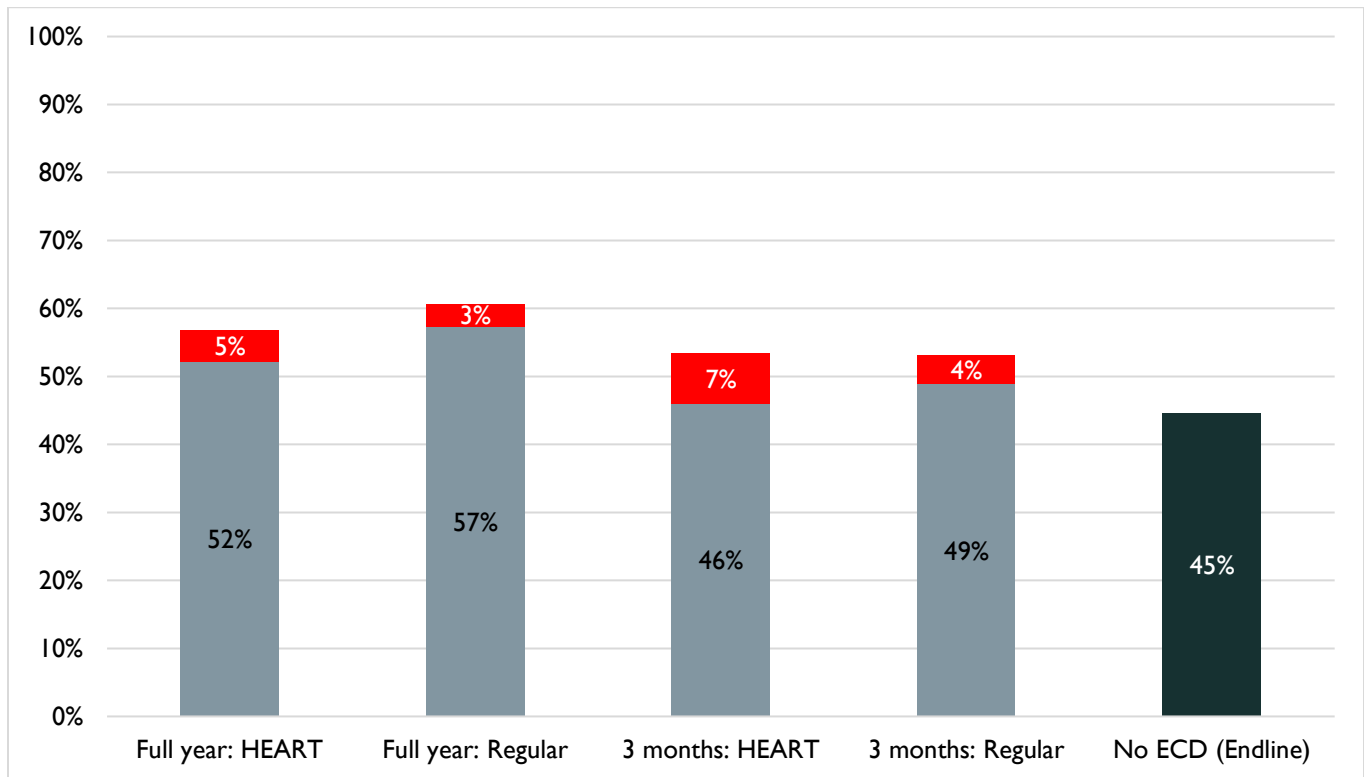
Finally, the IDELA tool in this study contained seven social-emotional items. Children made the strongest gains in empathy and the weakest in identifying strengths and preferences. There were no significant differences in gains made by children on any item between children in the regular and HEART programs. At endline, children had the strongest skills in self-awareness and the weakest in identifying strengths.

**Table 11. Average social-emotional development**

	Full year: HEART		Full year: Regular		Significant difference in gain?	3 months: HEART		3 months: Regular		Significant difference in gain?
	Baseline	Gain	Baseline	Gain		Baseline	Gain	Baseline	Gain	
Self-awareness	72%	4%	71%	9%		70%	4%	67%	6%	
Social connections	37%	2%	45%	-5%		31%	6%	33%	4%	
Solving conflict	44%	14%	56%	9%		44%	11%	45%	7%	
Personal preference	57%	-2%	57%	0%		48%	4%	53%	2%	
Strengths	29%	-2%	28%	2%		24%	3%	24%	2%	
Empathy	61%	12%	74%	7%		48%	13%	57%	6%	
Emotional awareness	66%	5%	71%	0%		57%	10%	63%	4%	
Total Social-emotional	52%	5%	57%	3%		46%	7%	49%	4%	



Figure 8. Average baseline and gain social-emotional skills by study group



## CONCLUSIONS AND NEXT STEPS

### Conclusion

In summary, results of this study suggest substantial differences in access, learning and equity for ECCD programs in Tuzla Canton. In relation to access, analyses found that children who were enrolled in full year preschool classes were significantly more likely to have parents who were more educated, and live in homes with fewer children, more storybooks and more relative wealth. This suggests that the needier children in Tuzla Canton have less access to full year ECCD programs.

Results of this study also suggest that children who have access to a full year ECCD program are significantly better prepared for primary school than their peers who attended a 3-month program or to those who did not attend ECCD at all. At the end of the school year children who attended a 3-month program displayed significantly stronger skills than those who did not attend ECD at all in social-emotional development and in overall school readiness (cumulative IDELA score), but not in the fine motor, literacy and numeracy domains. This suggests that perhaps being in a classroom with peers improved young children's social-emotional development relatively quickly but more time was needed to make substantial progress in academic domains like literacy or numeracy. However, further research is needed to confirm these hypotheses.

Overall, children had the strongest skills in fine motor development and the weakest in social-emotional development. This highlights the need for programs like HEART that focus on building children's social-emotional skills and assets. No significant effect of HEART was found in this evaluation but more research could help create a better understanding of the added value of the HEART program in both short (3-month) and full year ECD programs.

### **Next steps**

Based on the results of this study, suggested next steps include:

- Develop advocacy and policy materials lobbying for extension of ECCD/HEART with responsible authorities given the benefits of the longer duration of the program, skills gained and contribution to overall developments of the children that were enrolled in one year program as compared to 3-month program or no program
- Take findings and learning into SCiNWB plans to conduct Longitudinal Study in Tuzla Canton starting as of 2017
- Incorporate learnings in current 2016/2017 HEART program in Posavina and Una-Sana Canton (SCUS/HEART and Alta Mane) as well as in further scale-integration of HEART in Tuzla Canton (preschool curricula, strategies and techniques used while introducing and integrating learning outcomes for literacy in Tuzla Canton, other geographic areas in B-H
- Consider introducing structured realization of HEART in KGs /ECCD Units/Centers as well mentoring process in HEART programming with closer involvement of SCiNWB technical staff.

## APPENDIX A – REGRESSION TABLES

Table A1. Logistic regression results for predictors of full year ECCD access

VARIABLES	(1) Enrollment in full year ECCD
Mother education	1.227*** (0.270)
No. children at home	-0.677** (0.237)
No. storybooks at home	0.159* (0.0708)
Own a dishwasher	1.287*** (0.381)
Child is female	0.0912 (0.297)
Child age (year)	-1.297** (0.499)
Constant	4.020 (2.838)
Observations	296
Adjusted r-squared	0.2703

Robust standard errors in parentheses

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

**Table A2. Predicting IDELA endline scores, simple controls**

VARIABLES	(1) Motor (Endline)	(2) Literacy (Endline)	(3) Numeracy (Endline)	(4) Social- emotional (Endline)	(5) IDELA (Endline)
Child age (year)	0.139*** (0.0355)	0.141*** (0.0324)	0.131*** (0.0298)	0.0805** (0.0228)	0.123*** (0.0257)
Child is female	0.0543* (0.0239)	0.0129 (0.0240)	-0.0198 (0.0241)	0.0212 (0.0158)	0.0171 (0.0171)
Enrolled in HEART	-0.0573* (0.0256)	-0.0282 (0.0208)	-0.0524* (0.0237)	-0.0171 (0.0244)	-0.0387* (0.0159)
No ECD 3-month program	Reference 0.0537 (0.0372)	Reference 0.0656 (0.0416)	Reference 0.0719 (0.0459)	Reference 0.0783* (0.0314)	Reference 0.0674* (0.0317)
Full year program	0.111** (0.0343)	0.183*** (0.0406)	0.197*** (0.0443)	0.157*** (0.0316)	0.162*** (0.0319)
Constant	-0.127 (0.201)	-0.231 (0.191)	-0.183 (0.171)	-0.0355 (0.131)	-0.144 (0.148)
Observations	306	306	306	306	306
R-squared	0.189	0.234	0.217	0.174	0.298
Adjusted R-squared	0.176	0.222	0.204	0.160	0.286

Robust standard errors in parentheses

\*\*\* p&lt;0.001, \*\* p&lt;0.01, \* p&lt;0.05

**Table A3. Predicting IDELA endline scores, full controls**

VARIABLES	(1) Motor	(2) Literacy	(3) Numeracy	(4) Social- emotional	(5) IDELA
Mother education	0.0190 (0.0189)	0.0441** (0.0148)	0.0672*** (0.0169)	0.0352* (0.0133)	0.0414*** (0.0109)
SEARS-PRE Total	0.00492* (0.00236)	0.00503* (0.00216)	0.00355 (0.00308)	0.00730** (0.00206)	0.00520* (0.00196)
Child is female	0.0531* (0.0241)	0.0130 (0.0251)	-0.0177 (0.0244)	0.0199 (0.0159)	0.0171 (0.0174)
Child age (year)	0.132** (0.0370)	0.133*** (0.0336)	0.124*** (0.0326)	0.0701** (0.0219)	0.115*** (0.0272)
Enrolled in HEART program	-0.0552* (0.0269)	-0.0257 (0.0207)	-0.0500* (0.0227)	-0.0139 (0.0227)	-0.0362* (0.0153)
No ECD	Reference	Reference	Reference	Reference	Reference
3-month ECD	0.0587 (0.0371)	0.0736 (0.0421)	0.0816 (0.0431)	0.0866* (0.0339)	0.0751* (0.0321)
Full year ECD	0.101* (0.0389)	0.162*** (0.0388)	0.166*** (0.0411)	0.139*** (0.0267)	0.142*** (0.0307)
Constant	-0.327 (0.229)	-0.481* (0.224)	-0.426 (0.224)	-0.345* (0.150)	-0.395* (0.179)
Observations	306	306	306	306	306
R-squared	0.205	0.264	0.256	0.229	0.344
Adjusted R-squared	0.186	0.246	0.239	0.211	0.329

Robust standard errors in parentheses

\*\*\* p&lt;0.001, \*\* p&lt;0.01, \* p&lt;0.05

**Table A4. Predicting gains scores, with full controls**

VARIABLES	(1) Motor (gain)	(2) Literacy (gain)	(3) Numeracy (gain)	(4) Social-emotional (gain)	(5) IDELA (gain)
Mother education	-0.00162 (0.0169)	0.0103 (0.0115)	0.0210 (0.0129)	0.00557 (0.0138)	0.00516 (0.0102)
SEARS-PRE total	0.00352 (0.00189)	0.00187 (0.00161)	0.00139 (0.00176)	0.00471* (0.00177)	0.00247* (0.00101)
Child is female	0.0136 (0.0190)	-0.00691 (0.0214)	-0.000965 (0.0123)	0.00634 (0.0137)	-0.00334 (0.00969)
Child age (year)	0.0733** (0.0210)	0.0518* (0.0229)	0.0436* (0.0207)	0.0376* (0.0179)	0.0420** (0.0129)
Enrolled in HEART	-0.0223 (0.0176)	-0.00564 (0.0127)	-0.00196 (0.0157)	0.00431 (0.0177)	-0.00246 (0.00597)
Enrolled in full year ECCD	0.000322 (0.0200)	0.0385* (0.0174)	-0.000452 (0.0174)	0.0207 (0.0228)	0.00825 (0.00863)
Motor (baseline)	0.489*** (0.0537)				
Literacy (baseline)		0.675*** (0.0507)			
Numeracy (baseline)			0.799*** (0.0463)		
Social-emotional (baseline)				0.507*** (0.0544)	
IDELA (baseline)					0.705*** (0.0478)
Constant	-0.139 (0.139)	-0.143 (0.124)	-0.170 (0.107)	-0.140 (0.116)	-0.116 (0.0678)
Observations	257	257	257	257	257
R-squared	0.519	0.615	0.706	0.454	0.766
Adjusted R-squared	0.505	0.604	0.698	0.439	0.759

Robust standard errors in parentheses

\*\*\* p&lt;0.001, \*\* p&lt;0.01, \* p&lt;0.05

## APPENDIX B – INTERNAL CONSISTENCY

Internal consistency measures the correlation between items that propose to measure the same construct. Given the modifications made to the standard IDELA tool and the fact that SEARS-PRE had never been tested in Bosnia before, internal consistency calculations were performed for both the overall instrument and four of the subscales. The analyses produced standardized Cronbach’s alphas and use George and Mallery’s (2003) rules for interpreting the alpha:  $\alpha > .9$  is Excellent,  $\alpha > .8$  is Good,  $\alpha > .7$  is Acceptable,  $\alpha > .6$  is Questionable,  $\alpha > .5$  is Poor, and  $\alpha < .5$  is Unacceptable.

As can be seen in Table BI, all domains show acceptable internal consistency ratings, and the overall instrument has excellent internal consistency. These internal consistency ratings for the literacy, numeracy and motor domains are somewhat lower than average IDELA scores but the social-emotional is in line with previous results. Taken together, all SEARS-PRE items display an acceptable internal consistency. More work is needed to determine whether reliable subscales exist within the larger tool.

Table BI. Average internal consistency of IDELA domains and overall instrument

<b>Domain</b>	<b>Internal consistency</b>
<b>Motor Development</b>	.77
<b>Emergent Literacy</b>	.78
<b>Emergent Numeracy</b>	.77
<b>Social-emotional Development</b>	.78
<b>Total IDELA</b>	.90
<b>Total SEARS-PRE</b>	.71