unicef
for every child

EARLY CHILDHOOD DEVELOPMENT AND EDUCATION IN GEORGIA

Natia Andguladze, Tamar Gagoshidze, Ia Kutaladze
Education Policy and Research Association

September, 2020

MICS

დაავადებათა კონტროლისა და
საზოგადოებრივი ჯანმრთელობის
ეროვნული ცენტრი

The secondary analysis was prepared by the Education Policy and Research Association (EPRA) and is based on the Georgia Multiple Indicator Cluster Survey (MICS). The survey was conducted with support from the National Statistics Office of Georgia, NCDC, USAID, WB, UNFPA, SIDA, AFD, SCD, ISS, UNDP and WHO.

The publication is prepared with support of UNICEF. The views expressed herein can in no way be taken to reflect the official opinion of UNICEF or the donor organizations.

EXECUTIVE SUMMARY

The Multiple Indicator Cluster Survey is a study developed and supported by UNICEF with the purpose of assisting governments throughout the world in fulfilling their commitments to design and implement policies that will help children develop to their full potential. These include commitments to the Convention on the Rights of the Child and to the Sustainable Development Goals. The MICS was introduced two decades ago. Since then, more than 300 Multiple Indicator Cluster Surveys have been carried out in more than 100 countries, generating data on key indicators of the well-being of children and women, and helping shape policies for the improvement of their lives.

Georgia participated in three MICS cycles. The first cycle was implemented in 1999, the second in 2005, and the third cycle was implemented in 2018. The survey is the only source for nationally generalizable data on the development of young children in Georgia. The MICS data allows state and non-state actors in the country to track the country's early childhood development (ECD) progress over time, to identify key factors that can explain differences in ECD, and to use the findings to design targeted policies and interventions.

The objective of the secondary analysis of the MICS data for Georgia is to inform ECD policies and interventions. To meet the objective, using the MICS 2005 and 2018 data, and based on existing theoretical models, the study examines the relationship between a child's development outcomes and her environment in order to identify the factors that could explain differences in child development outcomes and to help recognize the characteristics of children at risk.

89 per cent of children in Georgia between 3 and 4 years of age are developmentally on track. Although almost all Georgian children reach targets in physical and learning development dimensions, only 25 per cent of them reach literacy and numeracy development targets, while 89 per cent reach social and emotional development targets. On average, the ECD growth rate is higher among girls compared to boys.

Other factors that could explain differences in early childhood development outcomes include parenting practices, resources for learning, and environmental factors. Namely:

- Cognitive developmental practices (e.g. reading, counting, and drawing) are strongly associated with a child's development. However, in Georgian families, cognitive developmental practices are not as common as social and emotional developmental practices (playing, taking outside, and singing). Contrary to existing evidence, playing with children does not have the expected outcomes on children's development, suggesting that Georgian parents' understanding of playing with children is not informed by basic principles of effective playtime with their children.

- A father's engagement in a child's development has strong positive implications for the child's development. However, fathers are the least active members of the household in all kinds of activities with their children; even other household members (grandparents or other adult members of the households) are more actively engaged in child development activities than fathers. Moreover, paternal engagement is higher among boys indicating a gender bias in fathers' caregiving practices. The fathers' lower participation, including the gender bias, is compensated for by the increased engagement of other members of the family (e.g. grandparents).

- Consistent with existing literature, in multigenerational households children receive more caregiving time, and children with other siblings get less time with their parents. On average, other members' engagement in a child's cognitive as well as their and social and emotional development is associated

with higher developmental outcomes. This indicates that grandparents can play an important role in a child's development and in compensating for lower parental engagement, especially in light of the decreasing trend in parental participation in a child's development during the last decade.

- Maternal engagement is positively correlated with paternal engagement and is negatively correlated with the engagement of other members in the family, as well as with an excessive exposure to media. This suggests that some parents use other adult members and media as substitutes for their lower engagement in a child's development.

- Around 20 per cent of children, between 2 and 5 years of age, spend two or more hours per day with electronics. Spending too much time with electronic devices, however, is associated with a lower ECD score and less likelihood of reaching the social and emotional development target. For example, children who spend two or more hours a day with electronics, compared to their peers with otherwise similar characteristics (age, gender, mother's education and age, family composition, place of residence) are 2.3 times less likely to reach the social and emotional development target. Even the more educated parents do not seem to be aware of/or wary of the negative implications of excessive use of media since the data does not show statistically significant differences in excessive media exposure by parental education.

- When children misbehave, most frequently parents use non-violent disciplinary measures. However, many parents also use violent disciplinary measures along with the non-violent ones. Consequently, the share of parents who use only non-violent disciplinary actions is 29 per cent. Exercising violent disciplinary practices with young children is common in Georgian families. Around 69 per cent of young children, according to their caregivers, had been subject to some form of violent disciplinary measure used by a parent or other adult family member during the target period. Among violent disciplinary measures, psychological aggression (shouting, yelling, or screaming at a child; calling a child dumb, lazy or another name) is more common.

- Exclusive use of non-violent disciplinary measures is associated with a higher score in ECD and a higher likelihood of reaching the social and emotional developmental target. Using any psychologically aggressive, physically violent, or severely violent discipline is associated with significantly lower scores in ECD, and reverting to any violent disciplinary methods to discipline young children reflected a 0.47 times lower likelihood of reaching the social and emotional development target for those children.

- The availability of learning resources is also a strong predictor of child development. Specifically, the availability of more than three children's books at home shows a strong association with ECD, literacy, and numeracy development, as well as the likelihood of reaching the social and emotional development target. However, while the availability of toys has significantly increased during the last decade, the availability of books has decreased since the last MICS cycle, from 6.3 books in the home in 2005 to 4.5 books in 2018. The share of children with no books at home increased from 21per cent in 2005 to 33 per cent in 2018.

- Preschool participation has significantly increased during the last decade from 45 per cent in 2005 to 78 per cent in 2018. The increase was greater among 3-year-old children. The change was particularly significant for children living in rural areas; the participation rate increased by 17 per cent in urban areas and by 43 per cent in rural areas. Also, the growth in participation is significantly sizable for children from more disadvantaged backgrounds; the participation rate for children whose mothers had reached only primary or lower secondary education increased by 42 per cent, and the participation rate for the children whose mothers reached secondary education increased by 47 per cent. The growth in participation is 21 per cent for children with mothers with higher education, and 32 per cent for children whose mothers have vocational education. However, the data does not show a statistically significant association between preschool attendance and any indicator of a child's development.

Children at risk have been identified based on the association of a child's individual, family, or contextual characteristics with: (1) the child's development outcomes and (2) family caregiving practices, resources for learning, and preschool participation. These risks groups include:

- *Children whose caregivers have functional disabilities (8 per cent)* are less likely to achieve developmental targets even after accounting for differences in economic and social background (wealth, education, books) and place of residence.

- *Children whose mothers have not achieved full secondary education (11 per cent),* even after accounting for family wealth and place of residence, perform significantly lower compared to their peers with more educated mothers. The mothers' education is also a good predictor of parental engagement in cognitive and socio-emotional development and availability of books at home. Only 3 per cent of children whose mothers have a higher education degree have no books at home, while over half of the children whose mothers have only primary or lower secondary education have no children's books. Compared to their peers with highly educated mothers, these children are 0.50 times less likely to be attending kindergarten. Compared to the children with more educated mothers, these children are also more likely to exhibit growth failure with a higher share of stunting, which is also associated with lower developmental outcomes. They are also more likely to be subject to violent discipline at home. The mothers' education is strongly corelated with family economic background; the groups of families in extreme poverty (poorest quintile 18 per cent) and mothers without a secondary education largely overlap.

- C*hildren from Azerbaijani and Armenian speaking families* show significantly lower developmental outcomes with particularly lower achievement outcomes among Azerbaijani speaking families. Also, on average and even after accounting for parental and family characteristics, children in Azerbaijani speaking families receive less time for cognitive and social and emotional attention from their parents and, compared to their peers in Georgian speaking households, are 4.5 time more likely to be disciplined using violent punishment methods. They are also more likely to have no children's books at home. Children in Azerbaijani speaking families are also more likely to have stunting in growth. Children in Azerbaijani and Armenian speaking households are 5 times less likely to be attending preschool.

- *Children with one or more siblings under 5 years of age,* after accounting for other family background characteristics, are also significantly less likely to reach developmental targets. They are also lacking in parental time and attention, and are more likely to be the subjects of violent discipline at home.

- *Children exposed to toxic chemicals* - arsenic (As) and lead (Pb) – with a higher share in Adjara, Guria, and Imereti (Pb) and Mtskheta-Mtianeti (As). Consistent with research from other contexts, high lead and arsenic exposure is associated lower ECD scores and a lower likelihood of achieving the social and emotional development targets. Higher lead exposure is also associated with the higher likelihood of being subject to violent disciplinary practices at home.

- *Strong disparities based on place of residence* are particularly pronounced for children in Adjara, but also for children in Samtskhe-Javakheti, Shida Kartli and Kvemo Kartli. Even after accounting for the differences in socio-economic status (wealth and education), children in Adjara perform significantly lower on all early childhood development indicators. In these regions, children tend to have less learning resources and parents who are less engaged in their development. Children in Adjara, Samtskhe-Javakheti, and Shida Kartli are significantly more likely to not have any books at home. Only 59 per cent of children in Samtskhe Javakheti and 41 per cent children in Kvemo Kartli attend kindergarten (compared to 90 per cent of children in Guria).

Recommendations:

Mobilize expertise to develop parental education programmes. There is no better alternative to good parenting. Therefore, parental education should be on the policy agenda for the relevant state and non-state stakeholders. The policies should be aimed at educating Georgian parents about: child development principles and techniques (including the development of children's literacy and numeracy skills), social and emotional development, positive disciplinary practices, selecting developmentally appropriate toys, and potential risks associated with excessive exposure to media. Reaching out to parents, however, is a challenging task. Therefore, not only the content but also the cost-effectiveness of parent education modalities should be carefully examined. Experience from other countries provides a wide repertoire of parent education programmes. These programmes are not equally effective for all parents. For example, engaging less educated parents can be more challenging than engaging those from higher socio-economic groups. Therefore, while self-administered parent training is effective for some parents, others will require a more individualized approach and closer guidance. Addressing parental education, therefore, will require testing for the effectiveness of various modalities differentiated by parent background characteristics. Parent education will also require the concerted intervention of various parties (e.g. social workers, pediatricians) who are equipped with relevant competences and a repertoire of methods and techniques.

Introduce interventions to compensate for the lack of learning resources at home. Possible interventions could include television programmes and resources online. The experience from other countries has shown that educational programmes can have a very strong positive effect on children's language and early reading skills development. The authors of the report also propose to help promote reading practices in preschools through equipping preschool libraries and by training teachers in effective reading strategies.

Develop a sustainable solution to improving the quality of ECEC. Addressing the quality of early learning programmes is critical for ensuring that the investment made in universal access to ECEC is beneficial for children. As evidence from other countries shows, for non-poor and more educated parents, preschool enrolment crowds out parental time. In other words, parents replace the time they spend with their children with the time in preschool. The challenge with this scenario is that for more educated parents, time spent in preschool is beneficial for their children only when the preschool quality is high. However, matching the quality of parental care of families with high cultural capital (educated parents, learning resources) is a challenging objective and requires substantial public investments in decreasing class size and investing in other quality improvement interventions for all. Alternative policy measures would concentrate more public resources on low socio-economic groups through introducing cost-sharing policy and differentiating public subsidies for ECEC by parents' socio-economic status. Cost-sharing practices from other countries provide for a myriad of design options. Scaling of any of the options should be preceded with examining their effectiveness through pilot projects.

Prioritize children at risk. State and non-state actors should prioritize children at risk in order to prevent negative consequences (e.g. failure at school, anti-social behaviour) and ensure that all children have a chance in life. Children from lower socioeconomic groups, minority children, children who have caregivers with disabilities, and children in certain areas of the country are neglected both by their families and the system. Programmes targeting children and their parents should be designed based on the experience of previous programmes with similar objectives, and systematically evaluated and adjusted to the needs of the programme beneficiaries.

TABLE OF CONTENTS

ABBREVIATIONS AND ACRONYMS

AS	Arsenic
BLL	Blood Lead Level
ECDE	Early Childhood Development and Education
LMICS	Low- and Middle-Income Countries
MICS	Multiple Indicator Cluster Study
PB	Lead
PIRLS	Progress in International Reading Literacy Study
PISA	Programme for International Student Assessment
PSU	Primary Sampling Unit
SES	Socio-economic status
TIMSS	Trends in International Mathematics and Science Study
UNICEF	United Nations Children's Fund

INTRODUCTION

RATIONALE

The early years of a child's life mark a period of tremendous growth and development with dramatic implications for the individual's well-being. A growing body of evidence, from various disciplines, demonstrates that the impact of the early years on a child's development extends beyond her community, and reaches to affect national development. Dramatic advances in neuroscience, molecular biology, genomics, and the behavioural and social sciences have helped deepen our understanding of the effect that one's environment can have on early neuronal and biological development, and the implications it can have on an individual's cognitive, socioemotional, and physical development.[1] Economic evidence highlights particularly high returns to early investment in human capital.[2] Evaluation science underscores that quality early childhood programmes impact both early and later human development, in cognitive, health, and socioemotional domains.[3] The mounting evidence has culminated in a growing understanding that early child development and programmes for young children and families are some of the most promising instruments for alleviating poverty and increasing social and economic equity for the world community.[4] Therefore, children's early years have emerged as a public policy focus around the world.

UNICEF, as a champion for children's rights and well-being, is assisting governments throughout the world in fulfilling their commitments (e.g. towards the Convention on the Rights of the Child, and the Sustainable Development Goals) to design and implement policies that will help children develop to their full potential. The Multiple Indicator Cluster Surveys (MICS) are one of UNICEF's support instruments. The MICS was introduced two decades ago. Since then, more than 300 Multiple Indicator Cluster Surveys have been carried out in more than 100 countries, generating data on key indicators on the well-being of children and women, and helping shape policies for the improvement of their lives.

Georgia participated in three MICS cycles. The first cycle was implemented in 1999, the second - in 2005, and the third - in 2018. The survey is the only source for nationally generalizable data on the development of young children in Georgia. The MICS data allows state and non-state actors in the country to track the country's ECD progress over time, to identify key factors that can explain differences in ECD, and to use the findings to design targeted policies and interventions.

1 Center on the Developing Child at Harvard University, 2010; Knudsen et al., 2006
2 Heckman & Krueger, 2003; Heckman et al., 2006
3 Aboud, 2006; Pence, 2008; Woodhead & Oates, 2009; UNESCO, 2010
4 Engle et al., 2007; Grantham-McGregor et al., 2007; Ulkuer, 2006

OBJECTIVES

The objective of the study is to inform ECD policies and interventions. To meet the objective, using the MICS 2005 and 2018 data, and based on existing theoretical models, the study examines the relationship between a child's development outcomes and her environment in order to identify factors that could explain differences in child development outcomes and help recognize the characteristics of children at risk.

METHODOLOGY

Analytical Framework

A child's development is a complex process of intricate interplay between the child's individual characteristics, her environment, and time. Therefore, in order to develop a comprehensive analytical framework, the report has considered various theoretical models on human development.

The framework uses a bioecological development model as the blueprint, but also incorporates some other complementary human development theories in order to create a comprehensive picture of early development. The bioecological model conceptualizes a child's development as interaction among (1) her environment, (2) the child's individual characteristics, and (3) time.

The environmental factors can be grouped as levels of influence, starting with the child's closest and most familiar - the family - and extending to the child's dominant cultural belief systems for which Bronfenbrenner's ecological system model provides a useful categorization. [5]

- The microsystem is the child's immediate environment, her family, but can also include extended family settings close to the child such as her neighbourhood, day care, or preschool. Decades of research in child development[6] have identified families and communities as key providers of the supportive relationships and positive learning experiences that young children need for healthy development. Theories on resources also help to explain the effect of family background on the availability of resources required for a child's development. The resources include time, money, and psychological and human capital resources, and translate into the time that children spend with parents and other adult role models, learning resources available at home, and the knowledge and skills invested in supporting that child's development. Families differ in their ability to provide these resources for their children. Less educated parents have less material and human resources to support their children's development. The parents with poor human capital usually have less social capital, which refers to the network of extended family and friends who can provide resources (e.g. advice on child caring methods, books to borrow, etc.).

- The mesosystem refers to interactions among microsystems such as family, neighbourhood, and preschool. The concept of a mesosystem helps us acknowledge that the child's environment is not simply a collection of microsystems, but also includes the communication among microsystems. Simply put, a child's development depends not only on the family and preschool environment, but also on the nature of interaction between the two. For example, according to the ecological model, a mesosystem is conducive to a child's development if the communication between family and preschool produces trust between the two parties, compatible expectations (e.g. on how a

5 Bronfenbrenner, 1979.
6 Phillips & Shonkoff, 2000

child should behave), a shared understanding of goals (e.g. what a child should be learning), and an evolving balance of power adequate to the child's evolving capacities. [7]

- The exosystem is the third level in the ecological system model referring to more distant influences, factors external to the children and adults, yet impacting them nonetheless, such as national education or healthcare policy. There has been considerable documentation of the extent to which public policies and formal services can enhance developmental outcomes for young children living in a wide variety of circumstances.

- The macrosystem represents the influence of even more distant factors, such as societal values and the cultural view of the child.

These levels of systems, to various degrees, interacting with a child's individual characteristics (sex, age, health) and time, can explain a child's development outcomes. In other words, although the factors described above are important determinants of a child's development, we should also acknowledge that the interaction of a child with her environment is conditioned by the child's individual characteristics. These characteristics include a child's age, gender, and health, but also include genetic factors that provide the initial blueprint for building brain architecture.[8]

Based on the analytical model and the data available from MICS 2018, this study explores:

1. Are there any differences in Georgian children's developmental outcomes based on the child's individual characteristics? For example, do girls and boys differ in their developmental outcomes? How do the child's individual differences reflect on the pace of development? In other words, do girls develop at a higher pace compared to boys?

2. What is the immediate environment of Georgian children, and what are the implications of the environment on the children's development? How have the environmental factors changed during the last decade? The environmental factors include both resources and processes. Resources covers factors such as parental education, family wealth, and children's books at home. Processes include parenting practices such as support for learning and disciplinary approaches. The study also examines the differences in development related practices at home by parental and family characteristics as well a child's individual characteristics (e.g. differences by gender in parental engagement or disciplinary approaches).

3. What are the implications of wider contextual environments (exosystem and macrosystem) on a child's developmental outcomes? There are two types of variables in the wider contextual factors: implicit and explicit. The explicit wider environmental factors include preschool participation and a child's exposure to toxic chemicals. Although exposure to toxic chemicals can be caused by parents and family behaviour (e.g. prenatal smoking), clustering the lead exposure by regions indicates that the concentration of the chemicals in the children's blood is caused by wider environmental issues. Implicit factors are a child's place of residence with embedded cultural beliefs and social norms.

7 Bronfenbrenner, 1979
8 Bronfenbrenner, 1999

Data Sources

The report is based on analysis of the data from UNICEF's Multiple Indicator Cluster Survey (MICS). The MICS collects information about health, nutrition, education, early development, and the well-being of children. For the analysis of early childhood development and education, this study uses data from questionnaires for household, individual women, individual men, children under 5 years of age, as well as children between 5 and 17 years of age. The household questionnaire provides data on place of residence, household wealth, ethnicity, education level of household members, as well as household composition (i.e. number of children, number of adults). The questionnaire for children under 5 years of age provides data on a child's early development outcomes, parenting practices, and preschool attendance. The questionnaire for children between 5 and 17 years of age provides information on preschool attendance and parental disciplinary practices for children 5 years of age. Additionally, the study incorporates the data of a child's anthropometric indicators and exposure to toxic chemicals in her environment, collected through blood tests. The latter covers only one child in the household. In some multivariate analyses, the study extends the test results to cover other children in the household.

Sample

The MICS6 data is based on a nationally representative sample of households. The sampling is based on three-stage sampling with implicit stratification, a type of geographic stratification that automatically distributes the sample proportionately into each subdivision. At the first stage, 250 to 350 primary sampling units (PSUs) are defined in the country based on the latest census enumeration areas. At the second stage, one cluster (10 to 30 households) is randomly selected from each PSU. Then, at the third stage, households in each cluster are systematically selected for an interview. The MICS 2018 sample size covers over 14,000 households.

The study is focused on children under 6 years of age including a subsample of children between 3 and 4 years of age in an early childhood development study. We use the subsample of 1,095 children to examine factors associated with early childhood development. In some analysis, children 5 years of age are also considered. Additionally, the current study has incorporated MICS 2005 data, specifically children under 5 years of age, in order to compare trends in some of the selected ECD indicators.

Table 1: MICS 2018 and MICS 2005 samples of the study target groups

Age in Years	2018	2005
<1	478	405
One	455	366
Two	511	419
Three	542	413
Four	554	434
< 5	2540	2037
Five	522	

Variables in the analysis

Based on both theoretical considerations and empirical findings from other MICS-based publications, several child, parental, family, and spatial variables were selected in order to examine their association with a child's development outcomes. These selected background and explanatory variables were re-coded where necessary. Detailed descriptions of the variables included in the study are provided in Appendix 1.

1. The variables of child development outcomes include:

    a. A composite score of child development (ECD), which was derived by summing up the number of positive responses across the literacy-numeracy, social-emotional, learning, and physical development domain items (total score ranging from 0 to 10), which is then normalized to a z-score (with a mean of 0 and standard deviation [SD] of 1).

    b. Literacy and numeracy development: A MICS indicator, dummy-coded variable denoting a child reaching literacy-numeracy if s/he can do at least two of the following: identify/name at least 10 letters of the alphabet; read at least four simple, common words; and/or know the name and recognize the symbols of all numbers from 1 to 10.

    c. Social-emotional development: A MICS indicator, dummy variable indicating a child being developmentally on track in social-emotional development if two of the following are true: the child gets along well with other children; the child does not kick, bite, or hit other children; and if the child does not get distracted easily.

The MICS also covers learning and physical development domains. However, there is no variation in the variable since 99 per cent of the children are developmentally on track. Therefore, the variables cannot be used in multivariate analysis.

2. Parenting activities include three dimensions: support for learning at home, disciplinary practices at home, and media exposure.

    a. Support for learning at home is measured based on the caregiver's reports of parental and other adult members' (over 15 years of age) engagement in various parenting activities. The respondent is asked to answer questions based on a period of the past three days. The MICS parenting activities consist of the following six activities: (1) reading books or looking at picture books with the child, (2) telling stories to the child, (3) singing songs with the child, (4) taking the child outside the home/compound/yard/enclosure, (5) playing with the child, and (6) spending time with the child naming, counting, and/or drawing things. The activities are used in the analysis as composite variables (meaning any engagement was counted, including if a member of the family had read to the child, or if the mother engaged in cognitive developmental activities). Composite variables are used in order to increase measurement reliability.

    b. A child's exposure to media at home is conceptualized as a dimension of parental caregiving with implications on a child's development. Time spent with electronic devices is included in the MICS survey. Namely, in the questionnaire for children under 5 years of age. The primary caregivers (typically, the mothers) were asked to provide information about the amount of time their children spent with computers, mobile devices, tablets or TV: either no time, less than one hour, between one and two hours, or two hours or more.

c. Disciplinary practices at home are measured by 12 items in the Child Discipline Module. Mothers/caregivers were asked if any member of the household used certain methods to teach children the "right" behaviour or to address a behavioural problem in the past 30 days. The methods are then categorized as non-violent or violent disciplinary practices. The latter includes psychological aggression, physical punishment, and severe physical punishment. The composite variables were used as predictor variables in the analysis presented in the study.

3. Parenting resources are measured by: (1) the number of children's books in the household and (2) playthings. We examine the effect of the number of books in the home using the "three or more books" MICS indicator as the threshold. Playthings include the availability of homemade toys (such as dolls, cars, or other toys made at home), toys from a shop or manufactured toys, and household objects (such as bowls or pots), or objects found outside (such as sticks, rocks, animal shells, or leaves).

4. Early formal learning is measured by: (1) whether the child currently attends any organized learning or early childhood education programme, including kindergarten or community child care, and (2) whether the child has ever attended any early childhood education programme. In the MICS questionnaire, attendance in early learning programmes is defined broadly and asked with the following question: "Does (NAME) attend any organized learning or early childhood education programme, such as a private or government facility, including kindergarten or community child care?" Thus, the category 'any organized learning or early childhood education programme' is an open category, which may include various early learning programmes, but excludes parenting or nutrition programmes. We examine the effect of attending an early learning programme on a child's development outcomes (including the effect of attending a private programme) and the factors explaining the likelihood of attending an early childhood development programme. For children 5 years of age, we use the database for children between 5 and 17 years of age. Namely, the variable on attendance at an educational institution or preschool is used.

5. A child's individual characteristics include age, sex, and a child's functional disabilities. The age variable represents a child's age measured in months.

6. A child's anthropometric indicators derived from measuring the child's height and weight, then weighted for the child's sex and age, were used as explanatory variables. Using the World Health Organization methodology, children with anthropometric failures were identified as children exhibiting wasting, stunting, or obesity.

7. Parental background characteristics include:

    a. The mother's and father's education level measured by the highest level of school attended and broken down into four categories: 1) primary or lower secondary, 2) secondary, 3) vocational, and 4) higher education. When parental education is used as a control variable, we normally include it as a continuous variable. In models that explain variation (e.g. parental engagement in a child's learning activities), parental education variables are included as categorical variables.

    b. The mother's age in years when the child was born

    c. The mother's/caregiver's functional difficulty

8. A family's background includes a measure of economic capital (household wealth) and its ethnolinguistic background. In the MICS database, household wealth is calculated using the principal component analysis and includes several items, such as the main material of the dwelling floor; the number of rooms in the dwelling; the main source of drinking water; the toilet facility used; if the household has electricity, radio, television, and/or refrigerator; if a member of the household owns a bicycle, motorcycle, and/or car; and the type of main cooking fuel used by the household. The measure is then divided into quintiles within each country. For ethnolinguistic background, the study classifies the language of interview with the mother/caregiver (Armenian, Azerbaijani, or Georgian).

9. Family configuration variables such as the mother's marital status, the child having a single caregiver, the father's absence from the household, the number of adult members in the household, the number of generations (one, two) in the household, the number of children under 5 years of age, and the number of children between 5 and 17 years of age, were also included in the analysis as proxies for the time available for a child's development, but also as control variables in most models.

10. Spatial variables, as proxies for implicit cumulative macrosystem differences (e.g. culture, resources, environment), are also examined to help identify children at risk, but also are included as control variables in most models. Region (there are 12 different regions) and urbanicity (urban or rural residence) are considered spatial variables and are included in the analysis as dummy variables. Depending on the variance in the outcome variable, as well as the sample size in certain cases (e.g. blood lead level), in most models, Tbilisi is used as a reference group, while all other regions (together with the urbanicity dummy variable) are included in at least one model for examining the effect of each explanatory variable while keeping spatial variables constant. In a few models, Tbilisi is included in the model controlling for spatial differences (together with the urbanicity dummy variable) and other regions are kept out of the model.

11. Blood lead and arsenic levels are also included in the analysis. Since the prevalence of lead and arsenic is highly correlated with place of residence, the study conceptualizes blood and arsenic levels as wider environmental factors.

Analysis methods

Most of the findings presented in the report are based on the multivariate analysis using multiple linear and logistic regression methods. For modelling child development outcomes and development indicators (e.g. home learning practices), for each explanatory variable several regression models were created. For most explanatory variables, control variables were selected following the theory-based approach where all theoretically and intuitively relevant variables are included in the models.[9] Thus, following evidence from other studies on a child's early development, relevant child, parental, family, and spatial variables were included in the regression models. The variables were added step-by-step to observe the change in the association between dependent variables and exploratory variables. From the list of the theoretically relevant variables, the control variables are selected by first conducting univariate analyses of each predictor variable from child, parental, family, and spatial variables.[10] The variables with a p value lower than 0.25 were included in as control variables. The models were tested for the relevant assumption violations including the assumption of the independence of errors. Appendix 2 provides summaries of the regression models.

9 Rothman et al., 2008
10 Bendel & Afifi, 1977

Weights

Data files were weighted with the relevant child weights available from the MICS databases. Weight calculation procedures are described in the Georgia MICS 2018 report. [11]

Missing data

The number of missing cases is 0 or close to 0 in most variables included in the analysis. For more on missing data in the MICS6 Georgia database, refer to the Georgia MICS 2018 report. [12]

Limitations

There are two main methodological limitations in the study. These limitations should be considered when interpreting the findings presented in the report. The first limitation is related to the design of the study. The analyses presented in the report are based on cross-sectional data and, therefore, do not allow for definitive causal interpretations. The findings about the relationships between child development and a child's individual characteristics, as well as parental, family, and contextual factors are correlational.

The second potential limitation is related to the measurement of early childhood development factors. In the MICS, child development factors are measured based on caregivers' responses to the questions related to a child's development. As in most studies with similar measurement techniques, there are potential limitations to the validity of measurements since parents can be subjective in assessing their children's capabilities. For example, in one large-scale study, the tendency to underrate children's abilities was documented among mothers with graduate-level educations. However, evidence from several studies shows high predictive and concurrent validity of parent-reported assessments of a child's language skills, vocabulary, and syntax.[13]

Structure of the report

The report starts by describing the methodology and the data used in the analysis. Then we proceed with discussing children's developmental outcomes and examine their association with home and contextual factors, such as: home support for learning, disciplinary practices at home, exposure to media, availability of learning resources at home, and preschool participation. The report also identifies the children at risk based on examining the link between the children's individual, parental, and family characteristics and the wider context. Finally, the report proposes recommendations based on existing evidence and the findings from the MICS data.

11 *https://www.unicef.org/georgia/reports/2018-georgia-mics-multiple-indicator-cluster-survey*
12 ibid
13 Feldman et al., 2005; Marchman & Martínez-Sussmann, 2002 ; Dale, 1991; Ring & Fenson, 2000

EARLY CHILDHOOD DEVELOPMENT OUTCOMES IN GEORGIA

The early childhood development index is a multidimensional measure, encompassing several aspects of a child's development including the physical, social, emotional, and cognitive. The ECDI is comprised of 10 caregiver-reported, dichotomously-scored questions. These 10 items were determined through multi-country field tests, validity, reliability studies, and deliberation with experts. [14]

The MICS ECD indicators help estimate the percentage of children between 3 and 4 years of age who are developmentally on track in literacy-numeracy, physical, social-emotional, and learning domains. For each domain, developmentally on track is defined as follows:

- Physical: A child is developmentally on track in this domain if one of the following is true: the child can pick up small objects with two fingers or is generally well enough to play. 99 per cent of Georgian children are developmentally on track in this dimension.

- Learning: A child is developmentally on track in the learning domain if one of the following is true: the child follows simple directions on how to do something correctly and/or when given something to do, he or she is able to do it independently. 99 per cent of Georgian children reach this developmental target.

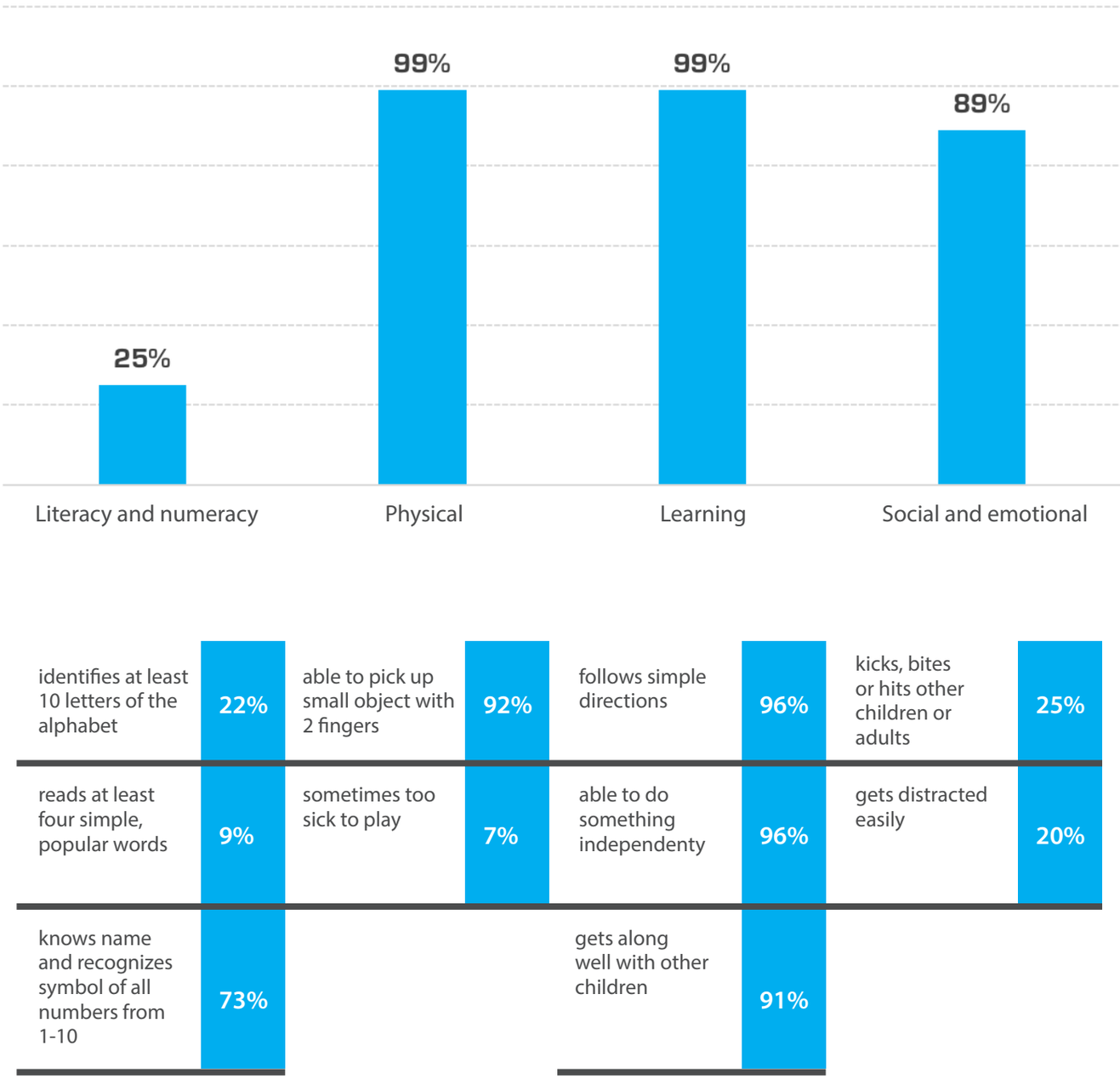
- Literacy-numeracy: A child is developmentally on track in literacy-numeracy if s/he can do at least two of the following: identify/name at least 10 letters of the alphabet; read at least four simple, common words; and/or know the name and recognize the symbols of all numbers from one to ten. 25 per cent of Georgian children reach this developmental target.

- Social-emotional: A child is considered developmentally on track in social-emotional development if two of the following are true: the child gets along well with other children; the child does not kick, bite, or hit other children; and the child does not get distracted easily. 89 per cent of Georgian children reach this target.

The ECDI is a composite index that considers children to be developmentally on track if they meet the criteria for at least three of the four domains. The report, however, uses an alternative measure of the ECDI where a composite score for ECD - created by summing the number of positive responses across the literacy-numeracy, social-emotional, learning, and physical development domain items (total score ranging from 0 to 10) - is then normalized to a z-score (mean of 0 and standard deviation [SD] of 1).

14 Loizillon et al., 2017

Figure 1: Georgian children, between 3 and 4 years of age, by the dimensions of child development



With age, children's developmental outcomes grow. One month in the life of children between 3 and 4 years of age is on average associated with a standard deviation of 0.02 growth in the composite ECD score. The effect of time, however, is more pronounced among girls (B=0.03, SE=.006, t=4.5, p<001) than it is for boys (0.01, SE=0.06, p<0.06).[15] The change in literacy and numeracy development is also statistically significant and amounts to around a 7 per cent higher chance on average by every month in the life of children between 3 and 4 years of age.[16]

15 Table 8: Summary of models on association between Child's Age in Months and ECD
16 able 9: Summary of logistic regression models on association between Child's Age in Months and Literacy and Numeracy Development

PARENTING PRACTICES

There is growing evidence to support the critical role that the quality and quantity of early stimulation and support in the home environment can play in a child's development.[17] The relationships between home developmental practices and a child's development are extremely complex. Therefore, we rely on some early childhood development models to group and categorize home caregiving practices.[18] Based on the models and the data available from the MICS survey, we group parent caregiving practices under three large categories: learning at home, disciplinary practices at home, and exposure to media at home.

The ways in which parents care for their children are also shaped by multiple factors including the individual characteristics of the child (e.g., age and gender), human capital of parents (e. g. knowledge and skills), economic capital (e.g. wealth and access to resources), intra-familiar characteristics (e.g. marital status and size of family) and the broader social context within which families operate (e.g., cultural beliefs, country's economic development level, and human development index). Therefore, the relationship between early development outcomes and parenting practices are examined with consideration given to the variation in individual, parental, family, and implicit macrosystem factors.

Thus, in line with existing frameworks, this chapter discusses:

- the effect of parenting practices at home on child development and
- determinants of parenting practices based on (a) the child, (b) the family, and (c) contextual characteristics.

SUPPORT FOR LEARNING

The analysis on support for learning at home presented in this chapter is based on the MICS dataset questions on household members' engagement in a child's development. Namely, in the questionnaire for children under five years of age, the primary caregivers (typically, the mothers) were asked to provide information on whether the mother, the father, and other household members over 15 years of age, had been engaged in three typical cognitive and three typical socio-emotional enriching activities with each child at home in the previous three days. The questionnaire covers up to a total of six types of activities in the target time period. Specifically, the questionnaire checked for the following three cognitive caregiving activities: (a) reading books or looking at picture books; (b) telling stories to the child; and (c) counting or drawing with the child. The three targeted socio-emotional caregiving activities were as follows: (a) singing songs; (b) taking the child outside the home, yard, or enclosure; and (c) playing with the child.

Based on the existing theoretical models and the data available from the MICS survey, the report groups home learning practices into two categories: cognitive development practices (CDP) and social and emotional development practices (SEDP). [19] These two dimensions of caregiving relate directly to children's cognitive and socio-emotional development and play critical roles in children's school achievement, skill acquisition, and well-being later in life.

17 Bradley & Caldwell, 1976; Marchman & Martínez-Sussmann, 2002; Marchman & Martínez-Sussmann, 2002
18 Bronfenbrenner, 1989; Bronfenbrenner, 1990; Shonkoff, 2010.
19 Bornstein, 2007

We start by describing home learning practices in Georgian families followed by discussing their implications on Georgian children's early childhood development (composite variable of early childhood development and some of its subcomponents). Lastly, we discuss how early childhood development activities at home are related to wider contextual and family characteristics.

The data shows that the majority of children under 5 years of age have at least one member of the household read books or look at picture books with them (71 per cent), tell them stories (77 per cent), count numbers or draw with them (70 per cent), sing songs with them (66 per cent), play with them (88 per cent), or take them outside (79 per cent). [20] Unsurprisingly, mothers are more actively engaged with their children than are fathers or other members of the household. Mothers are equally engaged both in cognitive and socio-emotional development activities with their children. Fathers are the least active members of the household in all kinds of activities with their children, while other household members (grandparents or other adult members of the households) are more actively engaged in child development activities than fathers. This difference holds true in families where the father lives in the household. Fathers are more likely to play with their children (37 per cent) or take them outside (27 per cent) than they are to read to children (13 per cent), tell them stories (13 per cent), or to count or draw with them (11 per cent).

Table 2: Support for learning at home by types of activities (children between 2 and 4 years of age, n=1606)

Types of activities	Any member of the HH	Mother	Father	Other member of the HH
Read with the child	69	57	14	22
Told stories	76	62	14	23
Counted or drew	73	63	13	20
Sang songs with the child	70	63	5	14
Played with the child	82	75	39	41
Took child outside	90	66	29	25

In Georgian families, the responsibility for child development is more disproportionately carried by mothers. With their young children (between 2 and 4 years of age), mothers participate in almost five times as many early developmental caregiving (cognitive and socio-emotional) activities with children at home compared to fathers (Mmother=3.9, SDmother =1.8; Mfather= 0.8, SDfather= 1.2).

20 Mothers or caregivers were asked about occurrence of the activities during the last week prior to the survey.

Table 3: Parental engagement in early development caregiving activities in 2005 and 2018 compared (for children between 2 and 4 years of age)

	MICS (n=1266)	2005	MICS (n=1606)	2018	Difference Statistics	
Types of activities	M	SD	M	SD	t	p
Number of activities with mother	4.1	1.9	3.9	1.8	-4.3	0.001
Number of activities with father	1.1	1.4	0.8	1.2	-9.0	0.001

Since the previous cycle of the MICS in 2005, parental engagement in early development activities with their young children has dropped. In 2005, on average, mothers participated in 4.1 different types of activities (out of 6, SD=1.9). This indicator has dropped by 0.20 points, and the decrease is statistically significant (t=-4.3, p<0.001). Similarly, paternal engagement has decreased as well from 1.1 to 0.8 (t=-9.0, p<0.001) (see table 2).

The report discusses associations between support for learning at home indicators with a composite indicator of early child development and its two subcomponents: early literacy and numeracy development and social and emotional development. The variables of the support for learning at home are composite variables. The report uses two categories of variables support for learning at home. Namely, the report examines support for learning by types of learning activities and by family member's engagement. The associations between the home learning activity variables and a child's development outcomes are examined by controlling for a child's characteristics (age and sex), language spoken at home, family socio-economic status (a composite index including maternal education, education of household head, number of children's books, and family wealth score), family composition (number of children under 5 years of age, number of children between 5 and 17 years of age, and the number of adult members in the family), and place of residence (region and urbanicity).

Different types of developmental activities — such as reading, telling stories, counting numbers or drawing, playing, singing, and taking the child outside— are provided in the MICS database. The variables are dichotomous variables indicating if any member of the family engaged with the child in the activity during the last three days. Thus, the reading variable could represent if a child's mother, father, or other member of the family (e.g. grandfather or an older sibling) read to the child or looked at picture books with the child.

Reading with the child or looking at picture books with the child is a strong predictor of a child's development. In the target population (children between 3 and 4 years of age), some 71 per cent of children, according to their caregivers, had been read to by their mother, father, or other family member. These children have, on average, a standard deviation of 0.38 higher score on their ECD compared to their peers who did not have similar experiences (t(1093)=5.8, p<0.001). The difference remains statistically significant after accounting for differences in age, sex, family SES, language spoken at home, family composition, and place of residence. Among children with similar individual, family, and residential characteristics, the difference associated with reading activity is 0.14 points on their ECD (SE=0.06, t=2,3, p<0.05). [21] Accounting for differences in a child's individual, family, and residential characteristics, the children who had the experience of reading with or looking at picture books with a family member are, on average, 1.6 (B=0.50, SE=0.19, p<0.01) times more likely to meet the literacy and numeracy benchmark compared to their peers whose mothers

21 ble 10: Summaries of multiple linear regression models on association between ECD and any member of the family engaging with child in reading, telling stories, and counting or drawing

or caregivers reported that their child did not have the same experience during the previous three days.[22] The data does not show statistically significant associations between reading and a child's social and emotional development. [23]

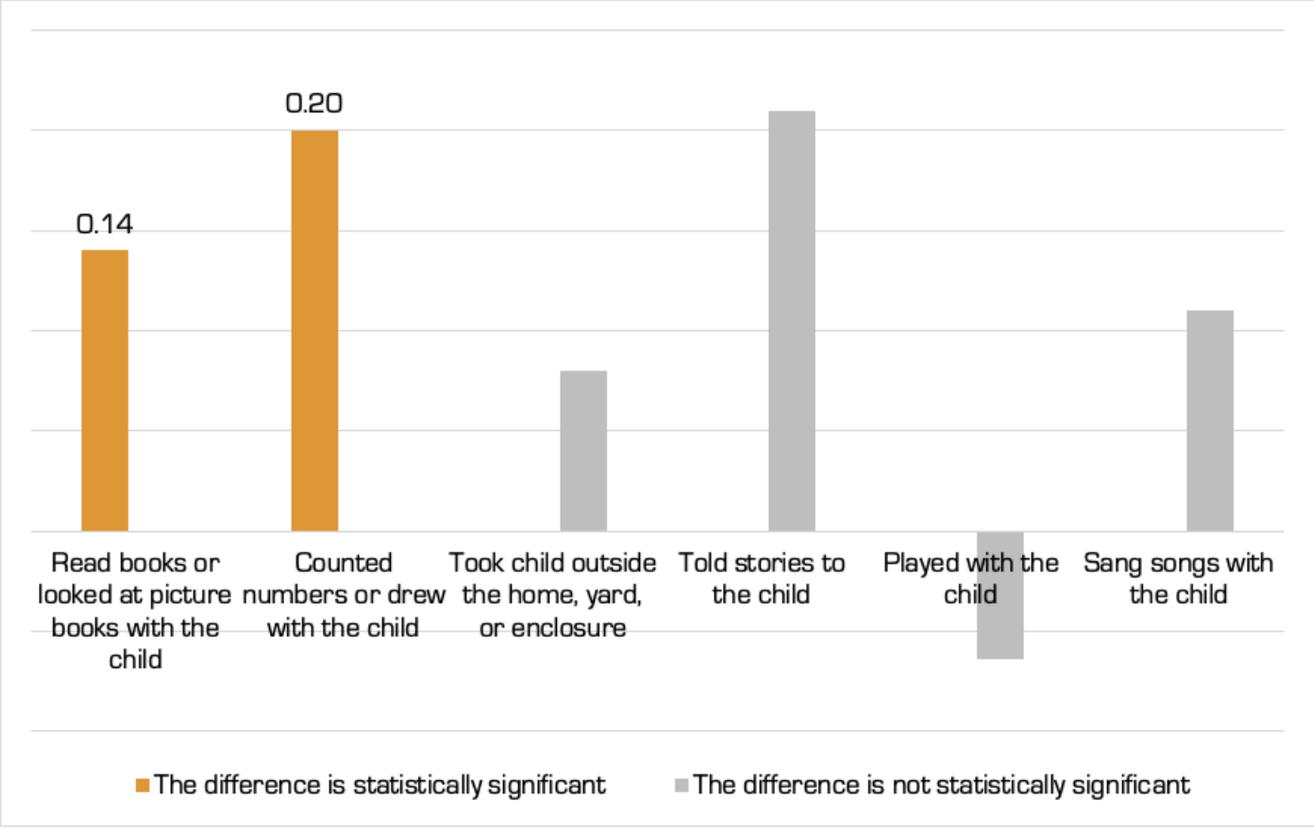
Counting or drawing with the child is statistically significant and strongly associated with a child's composite development indicator. The difference between the children with and without this experience is a standard deviation of 0.33 on their ECD ($t(1093)=4.6$, $p<0.001$). The association with a child's development composite indicator remains statistically significant after accounting for the child's individual, family, and place of residence variables; the children with this experience have, on average, a standard deviation of 0.20 higher score on their ECD compared to their peers whose mothers or caregivers said that their child did not have this kind of experience during the previous three days with any member of the family ($SE=0.06$, $t=3,4$, $p<0.001$). Counting or drawing is also associated with a child's literacy and numeracy development. However, the association is weak and is cancelled out after accounting for family characteristics (e.g. family SES or family composition). The data does not show statistically significant association with social and emotional development. The result – a strong and significant association with ECD but weak association with literacy and numeracy development and no association with social and emotional development – should be ascribed to differences in how the outcome variables are measured. The results are consistent with existing evidence. Namely, early numeracy and numeracy activities have been repeatedly linked to a child's early development. The evidence from large scale assessments in Georgia (e.g. PIRLS, TIMSS) also suggest a strong association between early numeracy and literacy activities with children's success in their school years: the children, whose parents report being more engaged in their children's early numeracy and literacy activities, perform higher on literacy, mathematics, and sciences tests in the fourth grade. [24]

The association of other types of activities with child development indicators are not consistently significant. Playing with the child, for example, shows no statistically significant association with the early childhood development composite indicator or social and emotional development. There is some difference in literacy and numeracy development when considering a child's age and sex. However, the difference is cancelled out by including family background characteristics in the analysis indicating that the difference between the children by variable is attributed to the differences in the children's family characteristics (e.g. SES, language at home). [25]

Taking the child outside (the home, compound, yard, or enclosure) by a member of the household shows statistically significant association with the composite indicator of a child's development. The effect is cancelled out by place of residence variables (urbanicity and regions) indicating that the difference in their ECD by activity can be attributed to the differences in taking the child outside by place of residence (higher in urban areas compared to rural areas and higher in Tbilisi compared to other regions). Testing the association between the activity and a child's literacy and numeracy development shows a statistically significant and positive link.

22 able 15: Summary of multiple logistic regression models on association between literacy and numeracy development and any member of the family engaging with child in reading, telling stories, or counting/drawing.
23 able 20: Summaries of models on association between social and emotional development and any member of the family engaging with child in reading, telling stories, and counting or drawing during the last three days
24 National Assessment and Examination Center, PIRLS and TIMSS national reports are available from the centre's web site – *www.naec.ge*
25 Table 19: Summaries of models on association between literacy and numeracy development and family member's engagement in child's social and emotional developmental activities

Figure 2: Association between the support for learning at home and a child's Early Childhood Development after accounting for differences in children's individual and family characteristics and place of residence



Interestingly, the relationship between taking a child outside and a child's social and emotional development shows statistically significant differences, and the association is negative. On average, children whose mothers/caregivers reported taking the child outside the home, yard, or enclosure during the last week are significantly less likely to reach the social and emotional development target compared to the children who did not have the experience. The finding might seem counterintuitive. Existing research underscores the importance of outdoor play since a safe, stimulating, and varied environment has significant developmental implications for physical, social, and cognitive growth.[26] However, research by Sheridan Bartlett can provide a meaningful explanation for our finding. In her work "No Place to Play: Implications for the Interaction of Parents and Children", an article based on participatory observational studies of families living in subsidized housing and drawing on the theory of attachment, she explains that playing outside is an opportunity for evolving the attachment relationship between a young child and a parent, allowing for gradually increasing distance from one another so that "what may begin as a game of peek-a-boo progresses to the point where an eighteen-month-old no longer feels anxiety when in a different room from her mother, knowing from experience that she can easily go and find her". But when young children and their caretakers are deprived of such opportunities, "this may contribute to more anxious and less flexible child rearing strategies on the part of the parent, and less independence and competence on the part of the children".[27] Taking a child outside the home, yard, or enclosure can be a caregiving practice more frequently exercised in families where young children do not have safe environments outside the home.

For example, in urban areas where apartment buildings don't have enclosed, safe playgrounds, children

26 Altman, I. (Ed.). 2012; Sebba, 1991
27 Bartlett, 1997

are constantly supervised by parents or other adults, which does not allow children to gradually distance themselves from their parents, or to start interacting with their environment more independently. The issue of the lack of safe playgrounds has been repeatedly underscored in literature calling for the consideration of children's well-being in urban planning. [28]

Singing to or with a child (sang songs to or with, including lullabies) shows a statistically significant association with a child's ECD, and the association remains statistically significant after accounting for family SES, language at home, and family composition. However, the effect is weak and loses statistical significance after controlling for urban/rural residence. Also, singing songs does not show statistically significant variations in literacy and numeracy development or social and emotional development.

The data does not show a statistically significant association with playing with the child. Again, the finding is not consistent with existing evidence suggesting that playing in early years is an essential part of cognitive, social, and emotional development. On the other hand, not all forms of play are equally beneficial for a child's development. For example, various forms of unstructured play lead to problem-solving, emergent literacy, conceptual understanding, creativity, and enhanced social skills, while structured play, which is more commonly practiced by parents, is limited to early knowledge acquisition. [29] The finding, therefore, can be explained by the mother's conceptualization of play. Several studies have documented the conceptual split in beliefs about what play constitutes, calling for renewed attention towards parent education. [30]

Family members' engagement in child's developmental activities: the variables are based on the same items as types of developmental activities. However, in this case, each variable represents the sum of the activities that the family member has engaged in with the child. Following the taxonomy proposed by Bornstein and Putnick, [31] the report conceptualizes the home learning activities into two categories: (1) cognitive caregiving practices - reading, telling stories, and counting numbers or drawing, and (2) socio-emotional activities – playing, singing, and taking the child outside. Thus, if a child's father read, told stories, and also counted numbers or drew with the child, the child's value for 'father's engagement in child's cognitive development' would be three.

The data shows that all members of the family can contribute to children's development. The mother's engagement in a child's development has a weak but statistically significant association with a child's development, and the association remains statistically significant after accounting for the differences in family SES, family composition, and place of residence. The father's engagement in general does not show statistically significant association with a child's development outcomes. However, the father's engagement in social and emotional developmental activities (playing, singing, or taking the child outside) is statistically significant and is associated with the child's composite development indicator; accounting for differences in children's individual and family characteristics and place of residence, the children whose fathers are more engaged in their socio-emotional developmental activities score higher on the ECD composite indicator ($B=0.09$, $t=2.81$, $p<0.01$). Interestingly, other family members' engagement is also statistically significant and associated with the child's development. Namely, other household members' higher engagement in cognitive developmental activities with the children is associated with a higher child development outcome. The association persists after accounting for family SES, language at home, family composition, and spatial characteristics ($B=0.10$, $SE=0.03$ $t=3,44$, $p<0.001$).

Explaining parental caregiving behaviour has been a subject of numerous studies. Previous studies

28 Davis & Jones, 1996; Davis & Jones 1997
29 Bellin & Singer, 2006; Bergen & Mauer, 2000; Parish-Morris et al., 2013
30 Fisher et al., 2008; Parmar et al., 2004
31 Bornstein & Putnick, 2012

offer three main groups of characteristics: child characteristics (e.g. age, gender), family characteristics (parental education), and societal characteristics (e.g. cultural beliefs). [32] Based on the existing frameworks, we examine parental engagement using child characteristics (age, gender), family characteristics (family composite wealth score, IDP status of the household head, ethno-linguistic background), family configuration (number of children under 5 years of age, number of children between 5 and 17 years of age, number of adults, presence of father in the household, multi and single generational family), parental characteristics (mother's age, mother's education level, father's education level, caregiver with disability status), time with electronic devices, number of children's books at home, preschool participation, and spatial variables (region, and urban or rural residence).

The mother's engagement in both cognitive and social and emotional developmental activities is strongly and statistically significant, and associated with the following observations and analyses:

- The caregivers' functional disability is associated with a standard deviation of 0.64 lower engagement (se=0.12, $p<0.001$) in cognitive developmental activities and a standard deviation of 0.44 lower engagement (se=0.13, $p<0.001$) in social and emotional developmental activities .

- The number of children between 5 and 17 years of age is negatively associated with both categories of maternal engagement.

- The number of children's books, namely, the availability of more than three children's books, is positively and strongly associated with both cognitive and social and emotional developmental activities.

- The father's engagement is positively associated with the mother's engagement. In other words, the higher the father's engagement in the child's cognitive development activities, the higher the mother's engagement in cognitive development activities as well.

- Other household member's engagement is negatively associated with the mother's engagement, which indicates that the mother's lower engagement is being compensated for by the other household members' engagement.

- The mothers speaking Azerbaijani, compared to Georgian speaking mothers, are less engaged in both cognitive and social and emotional development of the children.

A mother's cognitive development, which is different from a mother's social development, is also associated with:

- The mother's education level: mothers with higher education are more involved in reading, telling stories, and counting numbers or drawing with their children than the mothers with lower levels of education (vocational, secondary, or lower secondary).

- Spatial variable: Mothers living in urban areas, compared to mothers living in rural areas, are on average less engaged in their children's cognitive development.

- Children's time with electronic devices: this is negatively associated with their mothers' engagement in cognitive developmental activities. The children who spend two or more

32 Sun et al., 2016.

hours with electronic devices (computers, smartphones) – compared to their peers (with similar parental education, family composition, household wealth, etc.) who spend no or less (less than one hour) time with computers, phones, and other electronic devices, on average, receive less opportunities to engage in cognitive development activities with their mothers.

Variables associated with the mothers' engagement in playing with their children, singing to them, or taking them outside are associated with:

- The child's age – this association decreases by every month, amounting to a standard deviation of 0.12 decrease per year.

- The number of children under 5 years of age - this is positively associated with the mothers' engagement. Having another sibling under 5 years of age is associated with slightly more time for playing, singing, or going outside with their mother.

- Preschool attendance - this is positively associated with a mother's engagement in the category of activities. Mothers who take their children to preschool report engaging in more social and emotional developmental activities with their children.

The relative intensity of a father's engagement, in the case of both cognitive and socio-emotional caregiving practices, is strongly associated with the intensity of a mother's engagement in the same categories of practices. Similar to the case with a mother's engagement:

- In both cognitive and socio-emotional development, more children between 5 and 17 years of age are associated with less paternal engagement.

- The number of books at home is also positively and strongly associated with a father's engagement in his child's development, both cognitive and social and emotional.

- Statistically, children who attend preschool also have fathers who are more engaged in their cognitive development and vice-versa; children who do not attend preschool have fathers who are less engaged in their development.

- In families where children spend less time with electronic devices, fathers are more engaged with their children's cognitive developmental activities.

Unsurprisingly, the presence of fathers in the household is strongly and positively associated with their engagement in a child's development, and the inverse is also true.

Explaining a father's engagement in his children's developmental activities produced factors different from those regarding a mother's engagement. Namely:

- A father's engagement is positively associated with other family members' engagement in the cases of both cognitive and social and emotional development.

- While a mother's education level is associated only with the mother's engagement in cognitive developmental activities, in the case of fathers, both categories of a father's

engagement are associated with a father's education. This means that fathers with higher education are more engaged parents in general.

- Controlling for a child's individual, parental, and family characteristics, children living in urban areas, on average, get less cognitive development care from their fathers compared to their peers in rural areas (B=-0.25, se=0.10, $p<0.05$). In other words, among families with similar economic and cultural capital, fathers in rural areas are more engaged in their children's cognitive development.

- There are more children under 5 years of age associated with less paternal engagement regarding playing with the child, taking her outside, or singing to her.

- There are no differences in a father's engagement indicators regarding family ethnolinguistic background.

- Lastly, a father's engagement with socio-emotional development activities (playing, taking the child outside, singing) is associated with the child's sex. After accounting for differences in the child's age, parental education, family composition, wealth, and language spoken at home, as well as place of residence, female children tend to receive less paternal socio-emotional development care compared to their male peers (B=-0.11, se=0.05, $p<0.05$).

Other members' engagement in the child's development practices, similar to the mother's participation, is strongly and negatively associated with the language spoken (Azerbaijani) at home, both in the case of cognitive (B=-0.59, se=0.1, $p<0.001$) and socio-emotional development activities (B=-0.70, se=0.1, $p<0.001$). Similar to parental engagement, the number of children is also negatively associated with the amount of cognitive or socio-emotional care that an individual young child receives from other family members. Unsurprisingly, the number of adult household members is positively associated with other household members' involvement in a child's development.

The father's absence from the home seems to be compensated for by increased engagement by other members of the family, in the cases of both the cognitive and socio-emotional development of the child. Other adult members also seem to compensate for a father's gender bias; other adult members are more engaged in girls' socio-emotional development than in boys' socio-emotional development. Also, other household members' engagement with both cognitive and socio-emotional development activities are negatively associated with the mothers' engagement; mothers' higher engagement in cognitive development practices is associated with lower engagement with other members' engagement (and vice-versa). Similarly, when there are children whose mothers are less active in their children's socio-emotional development, there are adult household members who seem to compensate with their increased involvement in the children's development.

The findings about the role of other household members' engagement in children's development are consistent with ongoing discussions as well as with empirical evidence on grandparents' roles in children's development. The role of grandparents as partial caregivers for grandchildren is widespread in both developed and developing societies. For example, in the US, nearly six million children are being cared for on either a part-time or full-time basis by their grandparents. [33]

A national survey in Australia showed that 17 per cent of young children (between 4 and 5 years of age) receive regular care from their grandparents.[34] The 2004 Survey of Health, Ageing, and Retirement in Europe

33 Hayslip et al., 2019
34 Gray et al., 2005

(SHARE) showed that a remarkably high proportion of grandparents were found both to be looking after grandchildren and to accept the norm that grandparents ought to help care for grandchildren. Among the 10,000 respondents in these countries who had a grandchild under 15 years of age, 58 per cent of the grandmothers and 49 per cent of the grandfathers reported providing at least some care for a grandchild in the past year. Research on the impact of grandparents' engagement is scarcer. However, existing evidence suggests that grandparents' engagement can be redundant for children living in intact families, but can have positive and substantial effects on children from disrupted families,[35] or for children that are part of families in crisis. A study also found that grandparents' engagement had a buffering effect on the transmission of depression from mothers to their children. [36]

Studies have shown differences among countries in terms of grandparents' engagement in child caregiving. The European survey mentioned above, SHARE, compared Mediterranean countries to Scandinavian countries. The factors explaining the differences between the two groups of European countries can also help explain the findings of other family members' engagement from the MICS Georgia data. Namely, the following three factors have been identified to explain the differences between the South and the North: (1) cultural norms (reciprocal responsibility for the care of the elderly and children in southern cultures), (2) the availability of childcare (almost universal state-funded day-care in Scandinavian countries), and (3) the lower share of grandparents employed outside the home. [37]

Exposure to Media at Home

There is a growing global phenomenon in parental caregiving practices regarding the use of electronic devices by young children. The controversy around early access to media is increasing together with expanding access to personal media devices and internet. According to the MICS survey, around two-thirds of Georgian households have internet access at home, 62 per cent of families own a computer or tablet, and 70 per cent own a smartphone.

Time spent with electronic devices is included in the MICS survey. In the questionnaire for children under five years of age, the primary caregivers (typically, the mothers) were asked to provide information on the time their children spent with computers, mobile devices, tablets, or TV. The possible responses were broken down into the following time intervals: no time, less than one hour, between one and two hours, or two hours or more.

The section discusses:

- Time that children spend with electronic devices
- The implications of the time spent with electronic devices, and the association between the time spent with electronic devices with the composite indicator of early child development and its two subcomponents: early literacy and numeracy development and social and emotional development. The associations are examined controlling for a child's characteristics (age and sex), language spoken at home, household wealth score, household composition (number of children 5 years of age, number of children between 5 and 17 years of age, households with single caregivers, and father's presence in the

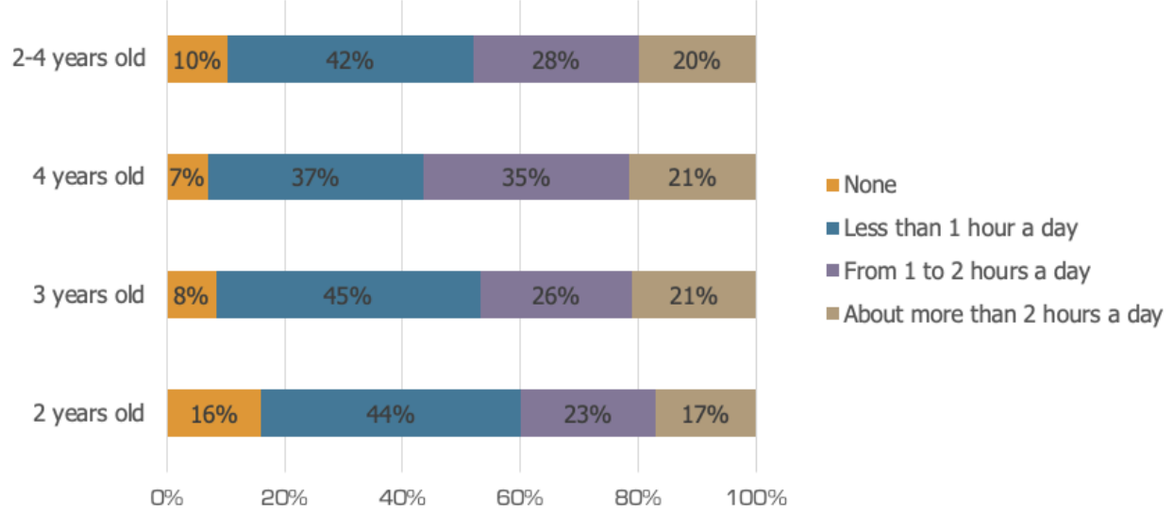
35 Ferguson, 2004
36 Uhlenberg & Cheuk 2010
37 Uhlenberg & Cheuk 2010

household), maternal characteristics (age and education level) and paternal characteristics (education level), home learning resources (books and playthings in the home), place of residence (region and urban or rural), family's access to internet, and the availability of a computer and/or smartphone at home.

- Main determinants of differences in the time spent with electronic devices.

Spending at least some time with electronic devices is common among young children in Georgia. Only 16 per cent of children under 5 years of age spend no time with electronic devices. Among the rest of children, around 44 per cent of them spend less than an hour, 23 per cent percent spend between one and two hours, and the remaining 17 per cent spend more than two hours with electronic devices. Spending time with electronic devices becomes more common with age. The share of children spending no time with electronic devices decreases from 16 per cent among children 2 years of age, to 7 per cent among children 4 years of age. The share of children using a computer between one and two hours a day increases from 23 per cent at 2 years of age to 35 per cent at 4 years of age.

Figure 3: Use of Electronic Devices by Child's Age

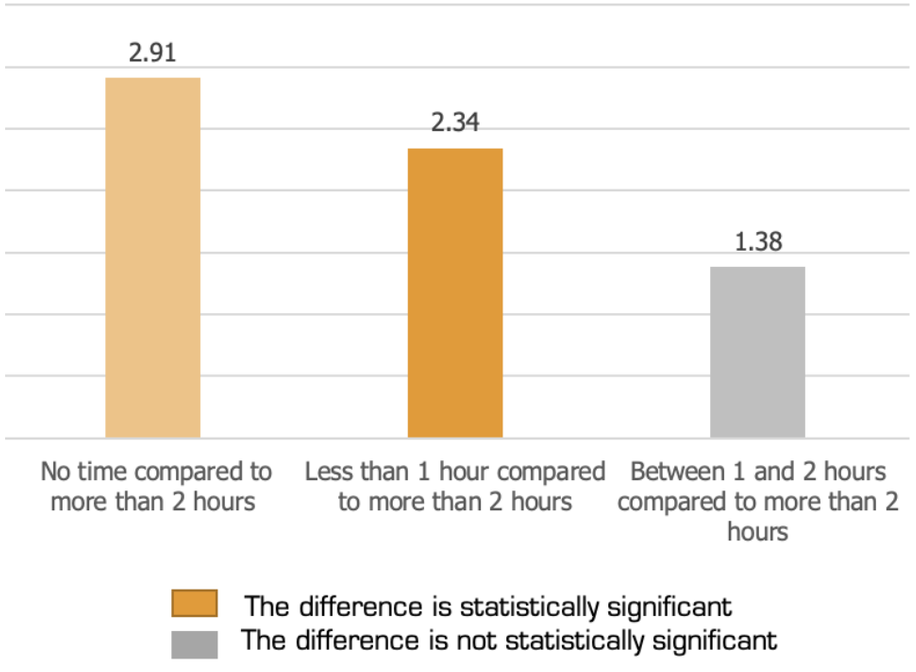


The time spent with electronic devices has implications for children's overall development, and specifically their social and emotional development. However, the link between the time spent with electronics and the child's development indicators is not linear. In other words, the data does not imply that more time spent with electronic devices translates to lower development indicators. Instead, the data indicates that spending time over a certain threshold – more than two hours – shows statistically significant differences than with the children spending less time. Compared to the children spending two or more hours with media, children spending less than one hour, score a standard deviation of 0.29 higher, and the children spending between one and two hours had a 0.20 score on early childhood development. The difference between spending less than one hour and spending more than two hours is stronger and persists after controlling for a child's age and sex, region (Tbilisi as reference group), urbanicity (urban=1), family and parental characteristics (composite wealth score and the language of the interview [Georgian as the reference group], parental characteristics [mother's education, father's education level {as continuous variables}, mother's age], family wealth score, language spoken at home, family composition [dummy variable for children having single caregivers], number of adults in the household, number of children is less than 5, number of children between 5 and 17 years of age), and books in the home. Accounting for the difference in a child's individual, family, parental, and contextual characteristics, children spending

less than one hour per day with media score a standard deviation of 0.26 higher compared to the children spending more than two hours per day with media (SE=0.08, t=3.23, p<0.001).[38]

The report finds strong association between social and emotional development, and time spent with electronic devices. Controlling for access to internet at home and the availability of a computer and/or smartphone, children who spend no time with electronic devices are 2.7 times more likely to reach the social and emotional development target (B=0.98, SE=0.48, p<0.05), and the children who spend less than one hour with media are 2.6 times more likely to reach the social and emotional development target (B=0.97, SE=0.26, p<0.001). The relationship persists after accounting for a child's individual, parental, family, and spatial characteristics. The figure below shows that the children with otherwise similar characteristics, but who spend no time with electronic devices, are 2.9 times more likely to reach the social and emotional development target (B=1.07, SE=0.51, p<0.05); the children who spend less than one hour per day with media are 2.3 times more likely to reach the socio-emotional developmental target (B=0.85, SE=0.28, p<0.001). The difference between spending between one and two hours or more than two hours per day is not statistically significant. [39]

Figure 4: Odds ratios for reaching socio-emotional developmental target by time spent with electronic devices[40]



38 Table 33: Summary of multiple regression models on ECDI with time with electronic devices as predictor variable (n=1095)
39 Table 34: Summary of logistic regression models on social and emotional development with time with electronic devices as predictor variable (n=1095)
40 The model is adjusted for access to internet, computer, and/or a smartphone at home, the child's age and sex, region (Tbilisi as reference group), urbanicity (urban=1), family and parental characteristics: composite wealth score, language of the interview (Georgian as the reference group), parental characteristics (mother's education level, father's education level [as continuous variables], mother's age), family wealth score, language spoken at home, family composition (dummy variable for children having single caregivers, number of adults in the household, number of children less than 5 years of age, number of children between 5 and 17 years of age), and number of books at home.

The data does not show a statistically significant relationship between time spent with electronic devices and literacy and numeracy development.

Existing evidence suggests a linkage between excessive use of media and obesity. Consistent with the findings, the MICS data shows a strong association between spending over two hours with electronic devices and the likelihood of a child being obese (weight-for-height z-scores above 2 SD). Controlling for a child's age and sex, children spending over two hours with electronic devices are 2.5 times more likely ($B=9.4$, $SE=0.3$, $p<0.01$) to be overweight compared to children with a lower exposure to media.

Considering the possible effect of spending more than two hours with media on a child's socio-emotional development, and the risk of obesity, it is important to examine the child's associated parental and family characteristics. The analysis brings out the following factors:

- In families with internet access, children are 2.5 times more likely to spend more than two hours with electronic devices.

- Family composition: Having more adult members in the household is associated with a higher likelihood of spending over two hours with electronic devices. The result could mean that having more adults in the household means that there are more people with smartphones or computers, and more opportunities for using older family members' devices. And the greater the number of children under 5 years of age, the lower the probability of spending time with electronic devices.

- In families where mothers are more engaged in a child's cognitive development, children are less likely to spend more than two hours with electronic devices.

- Higher engagement of other adult family members (e.g. grandparents) in children's socio-emotional or cognitive development activities is associated with a greater likelihood of spending over two hours with electronics. This does not necessarily mean that other family members' engagement provokes children's use of electronic devices. This result indicates that spending too much time with electronic devices (watching TV, playing with smartphones or on the computer) is correlated with the higher engagement of other members of the family in the care for children. This finding relates to the previous finding on other adult members' care compensating for the lack of parental care. These two findings imply that in families were children lack parental engagement in their cognitive and social development, children spend more time with other adults (grandparents, aunts, older siblings) as well as with electronic devices.

- The number of books (more than three books) in the home is negatively associated with spending over two hours with electronic devices. Children who have less than four children's books at home are twice as likely to spend more than two hours with electronic devices.

- The likelihood of spending over two hours per day with electronic devices does not differ by parental education. [41]

41 Table 35: Logistic regression models on spending more than two hours per day with electronic devices among children between 3 and 4 year

Disciplinary Practices at Home

There is a growing body of evidence demonstrating linkages between parental discipline techniques and a child's development. During the last two decades, research on physical punishment has shown that violent discipline at a young age is strongly associated with child aggression and mental health, parent–child relationships, and family violence in adulthood. For example, in one of the first studies on the topic, in a large Canadian sample , there was a strong association between slapping and spanking in childhood with psychiatric disorders in adulthood.[42] Since then, these findings have been supported in numerous studies. Physical punishment is associated with a range of mental health problems in children, youth and adults, including depression.[43] It has also been linked with unhappiness, anxiety, feelings of hopelessness, drug and alcohol addiction, general psychological maladjustment, slower cognitive development, and low academic achievement.[44] Evidence from neuroscience studies further strengthens the link. Both physical punishment and psychological abuse have been linked to brain development.[45] For example, a study found that the development of the auditory association cortex involved in language processing may be affected by exposure to early stress and/or emotionally abusive language. Physical punishment has been linked with reduction to the volume of the brain's grey matter in areas associated with intelligence. [46]

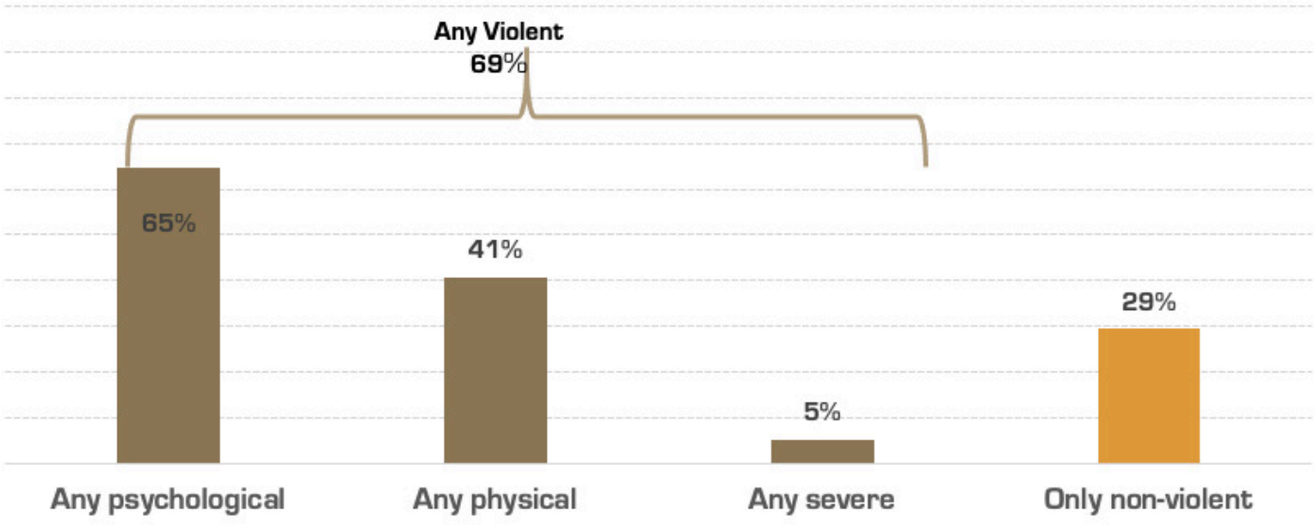
The MICS survey covers parental discipline practices. Caregivers were asked about various disciplinary practices by parents and other adult members of the family, and how they are exercised towards their children. Namely, the survey includes a module on child discipline with 12 items. The items in the Child Discipline Module are grouped into the following categories:

- Non-violent discipline
- Violent discipline
- psychological aggression
- physical punishment
- severe physical punishment

This chapter describes family disciplinary practices according to the above listed categories and examines potential implications of disciplinary practices on a child's development indicators. The chapter discusses the main determinants in differences in parental disciplinary practices.

42 Afifi et al., 2006; MacMillan et al., 1999.
43 Turner & Muller, 2004
44 Kiernan & Huerta, 2008; Whitted, 2011
45 Tomoda et al., 2011
46 Tomoda et al., 2008.

Figure 5: Types of disciplinary practices exercised towards children between 2 and 4 years of age



Shouted, yelled or screamed at child	63%	Spanked, hit or slapped child on bottom with bare hand	32%	Hit or slapped child on the face, head or ears	4%	Explained why behaviour was wrong	93%
Called child dumb, lazy or another name	13%	Shook child	15%	Beat child up as hard as one could	1%	Gave child something else to do	59%
		Hit or slapped child on the hand, arm, or leg	7%			Took away privileges	34%
		Hit child with belt, brush, stick, etc.	1%				

Most frequently, young children's behavioural problems are addressed by non-violent disciplinary measures. According to 95 per cent of caregivers, the response to a child's behavioural problem is explaining why the behaviour was wrong. Caregivers also report using other non-violent measures such as giving the child something else to do (59 per cent) or taking away privileges (34 per cent). However, many parents also use violent disciplinary measures along with the non-violent ones so that the share of parents who took only non-violent disciplinary actions comes down to 29 per cent.

Exercising violent disciplinary practices with young children is common in Georgian families. Around 69 per cent of young children, according to their caregivers, were subject to some form of violent disciplinary measures used by a parent or other adult family member during the last 30 days. Among violent disciplinary measures, psychological aggression (shouting, yelling, or screaming at the child; calling the child dumb, lazy, or another name) is more common. 41 per cent of children were subject to some form of physical punishment (e.g. spanking, hitting, or slapping the child on the bottom [32 per cent], shaking the child [15 per cent]). Some 4 per cent of children experienced severe physical punishment from adults in the household (e.g. hitting or slapping the child on the face, head, or ears [4 per cent]).

Disciplinary measures show a statistically significant association with a child's composite development indicator and her social and emotional development. The children whose caregivers report exercising exclusively non-violent methods to discipline their children (e.g. explain why the behaviour was wrong, took away privileges) score a standard deviation of 0.14 higher on the Early Childhood Development Composite Score (SE=0.07, t=2.15, p<0.14) compared to the rest of the children with similar individual (age, sex), family (wealth, composition, language), and parental (education, age) characteristics and place of residence (region, urban/rural). These children also have a 2.3 times higher likelihood of reaching social and emotional development targets. Accounting for the individual, family, parental, and contextual characteristics:

- Exercising any psychologically violent discipline is associated with a standard deviation of 0.21 lower score (SE=0.06, t=3.35, p<0.001) on a child's ECD composite score, and a 0.42 times lower likelihood (B=0.86, SE=0.27) of reaching social and emotional development targets.

- Using any physical punishment method to discipline children is associated with a 0.15 lower score (SE=0.06, t=2.55, p<0.001) on the ECD and a 0.53 times lower likelihood (B=0.64, SE=0.21) of reaching social and emotional development targets.

- Severe physical punishment, though rarely reported by caregivers. has more dramatic implications: a standard deviation of 0.45 lower score on the ECD composite scale (SE=0.14, t=3.2, p<0.001) and 0.23 times lower likelihood of reaching social and emotional development targets (B=1.48, SE=0.36).

- When adults in the family reverting to any violent (psychological or physical) disciplinary methods to discipline young children there is a 0.47 times lower likelihood of reaching social and emotional development targets.

Considering the potential effect of disciplinary measures exercised towards children, and the factors associated with different discipline practices in Georgian families, the report finds that using any violent disciplinary measure is strongly associated with the following factors:

- Age: violent punishment methods are more pronounced in children between 3 and 4 years of age. As illustrated in the Figure 6, among young children, physical punishment practices

become more pronounced in children between 3 and 4 years of age, and decreases at older ages.

- Regions: parents in Guria, Kakheti, Shida Kartli, and Kvemo Kartli are less likely to use to non-violent disciplinary practices only. The effect of the location variable fades out for the children living in Kvemo Kartli after accounting for the language in the household. However, in the case of Guria, Shida Kartli, and Kvemo Kartli, the association persists and remains statistically significant. The children in these regions are also more likely to experience violent disciplinary measures exercised by their parents and other adult members of the household. Psychologically violent punishment methods are also higher in some regions; even after accounting for differences in family and parental characteristics, children in Adjara, Guria, Kakheti, Shida Kartli, and Kvemo Karti are more likely to be exposed to psychologically violent discipline compared with their peers in Tbilisi. Physical disciplinary practices are also associated with residence; children in Kakheti are more likely to be disciplined using physical punishment methods, and children in Imereti are less likely to be subject to physical punishment. The difference between Kakheti and other regions persists after adjusting for family and parental characteristics; on average, children in Kakheti are two times more likely to be disciplined using physical punishment compared to their peers in other regions. The effect of living in Imereti fades out after accounting for family background.

Figure 6: Differences in physical punishment practices by child's age

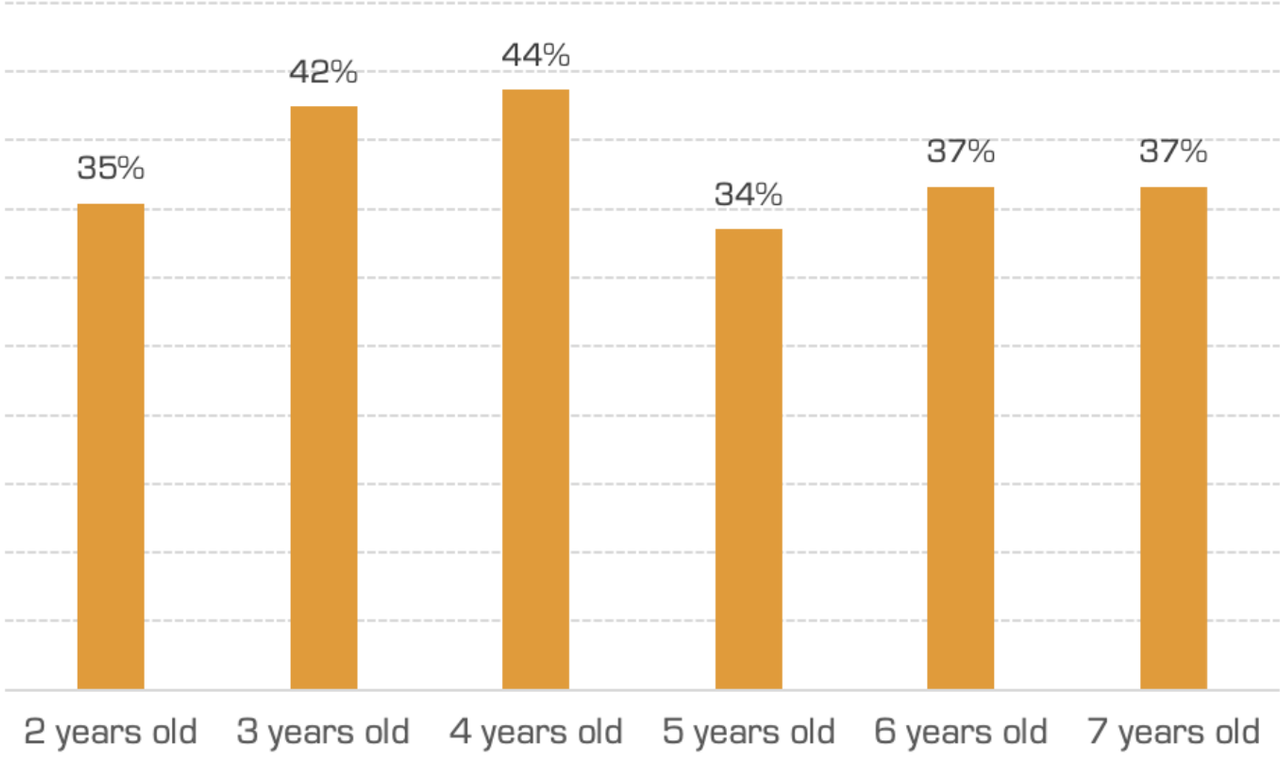
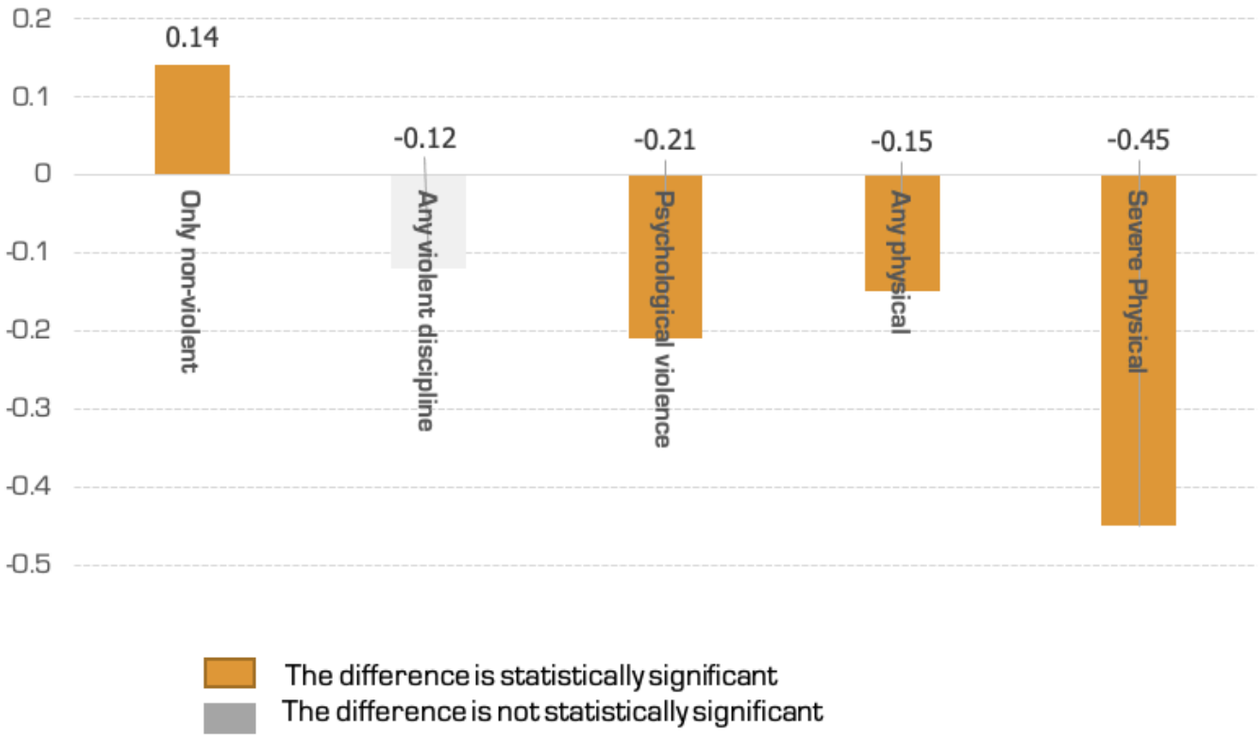


Figure 7: Differences in ECD Composite Scores by Disciplinary Practices

The figure shows unstandardized coefficients of estimates adjusted for individual, family, parental, and contextual factors.



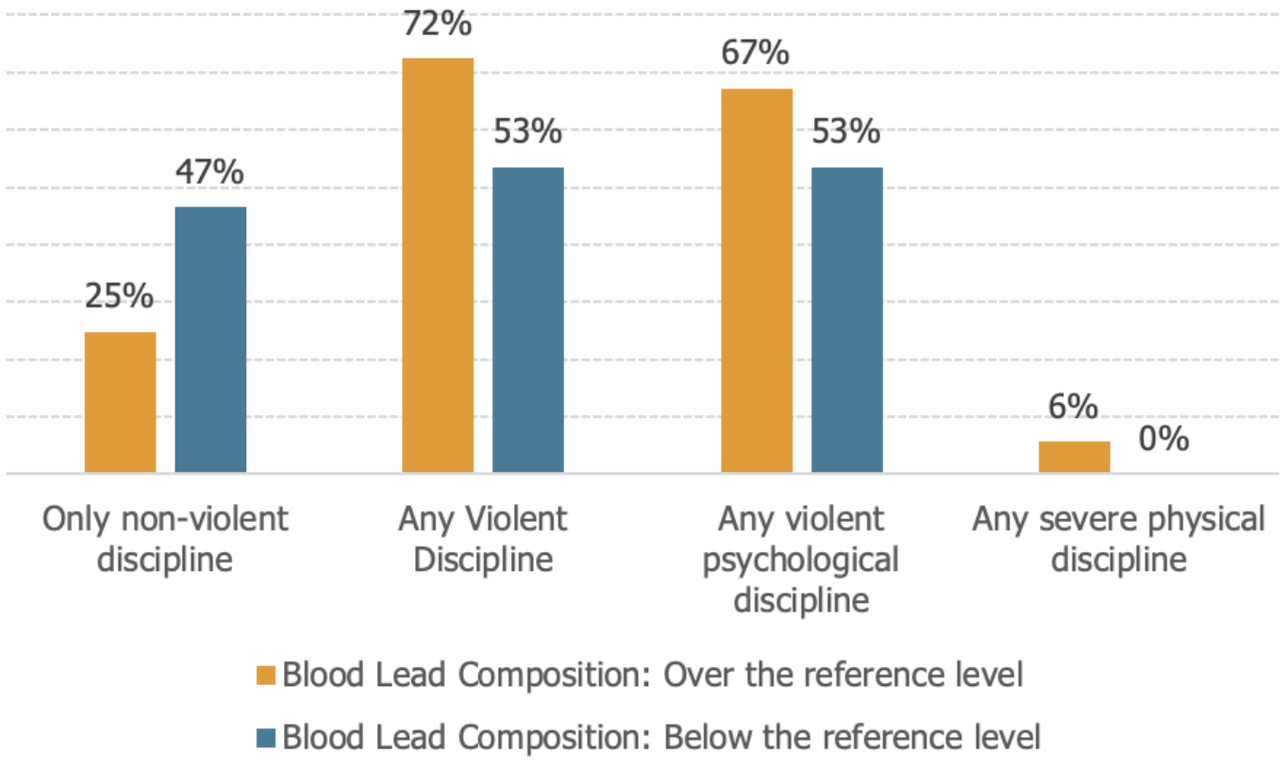
- Blood lead level: children with a blood lead value below the reference level (5 micrograms per decilitre (µg/dL) of whole blood) are less likely to be exposed to violent discipline and more likely to be disciplined using only non-violent measures. The relationship persists after adjusting for family characteristics, mother's education and age, family composition, and a child's age and sex. Children with a lead concentration above the reference level (compared to the children whose blood level concentration is below the reference level) are two times more likely to be exposed to any type of violent discipline (B=0.67, SE=0.36, p<0.01). There are two possible ways to interpret the results:

    1. Children with high lead levels in their blood are more likely to exhibit problematic behaviour. There is growing evidence linking lead exposure not only to cognitive development, but also to behavioural problems among children.[47] High concentrations of lead have also been linked with attention-deficit/hyperactivity disorder among children. [48] When there are higher incidences of problematic behaviour exhibited by children, parents are more likely to resort to violent discipline.

    2. In families where children are exposed to lead, adults are most likely to also be exposed to lead. Research shows that high exposure to lead can be linked with more aggressive behaviour among adults.[49] In other words, in the families with high exposure to lead, adults could be more aggressive in general, including towards their younger children.

47 Ernhart et al., 1989; Wasserman et al., 2000; Dietrich et al., 1993 ; Sciarillo et al., 1992
48 Froehlich et al., 2009.
49 Stretesky & Lynch 2001

Figure 8: Disciplinary practices by blood lead value in Tbilisi



- Type of settlement: In urban families, parents and other adults are more likely to exercise violent punishment measures compared to families in rural areas. However, accounting for the differences in family wealth, this indicates that families with similar economic backgrounds, but living in different settlement styles (urban or rural), do not differ in their child discipline practices. In other words, differences in disciplinary practices between rural and urban families exist, however, the difference can be attributed to the differences in economic background.

- Family wealth score is also statistically significant and associated with the likelihood of exercising psychological violence against children. However, the relationship contradicts existing literature, which indicates that poverty is one of the explanatory factors for violence against children. In our case, however, adjusting for other family and parental characteristics, parents and family members from poorer households are less likely to use psychological punishment methods towards their children.

- Language spoken at home (measured by the language of the interview with the child): there is a strong correlation between language spoken at home and violent punishment methods. The relationship persists after accounting for a child's family wealth, place of residence, the mother's education and age, and family composition; in Azerbaijani speaking families children are 4.5 times more likely to be disciplined using violent punishment methods (B=1.51, SE=0.44, p<0.001). [50]

- Children who have other young siblings (siblings under 5 years of age) are more likely to be subjected to physically and psychologically violent discipline from their parents or other members of the family.

50 Table 38: Logistic regression models on "any violent disciplinary practices at home" among children between 3 and 4 years of age (n=1095)

HOME RESOURCES FOR LEARNING

The resources that parents provide for children, such as books and toys, represent an important part of the supportive home environment. Studies have shown that toys predict developmental outcomes, and books and toys can be strong instruments for enhancing verbal interaction. [51]

The availability of children's books and toys is included in the MICS survey. Namely, in the questionnaire for children under 5 years of age, the primary caregivers (typically, the mothers) were asked to provide information on the number of children's books at home, whether children had homemade toys (such as dolls, cars, or other toys made at home), toys from a shop or manufactured toys, and household objects (such as bowls or pots), or objects found outside (such as sticks, rocks, animal shells or leaves) to use as toys.

Based on the existing literature, the chapter discusses:

- the availability of learning resources at home, and a trend in the data between 2005 and 2018;
- the implications of the availability of home learning resources on child development. This section discusses associations between the availability of different types of toys and children's books with the composite indicator of early child development and its two subcomponents: early literacy and numeracy development, as well as social and emotional development. The associations are examined, controlling for a child's characteristics (age and sex), language spoken at home, household wealth score, household composition (number of children under 5 years of age, number of children between 5 and 17 years of age, households with single caregivers, and a father's presence in the household), maternal characteristics (age and education level) and paternal characteristics (education level), home learning resources (books and playthings at home), and place of residence (region and urban or rural setting); and
- determinants of disparities in the availability of books at home.

Availability of Learning Resources at Home

The majority of children have access to books and toys at home. 94 per cent of children have toys from shops. Less than one percent of children have no toys in the home. 67 per cent of children have at least one children's book at home. The availability of toys from shops has increased since the last MICS cycle from 86 per cent of children having shop toys in the home to 94 per cent having them. We see a different trend in the availability of children's books, however. Since the last MICS survey, the availability of children's books in the home has decreased from 6.3 books in 2005 to 4.5 books in 2018, and the share of children with no books in the home has increased from 21 per cent in 2005 to 33 per cent in 2018.

51 Dickinson & Tabors, 1991

Table 4: Availability of books and toys at home for children under 5 years of age in the 2005 and 2018 MICS cycles

	2005	2018
Homemade toys	18%	12%
Toys from shops	86%	94%
Household objects or outside objects	34%	64%
Children's books	6.3 (SD=4.2)	4.5 (SD=4.3)
Children with no children's books at home	21%	33%

The Implications of Home Resources for Learning on a Child's Development

The availability of books is a strong predictor of the early childhood development composite score and its subcomponents. Having four or more children's books as the predictor variable shows that children who have more than three books in the home, on average, score 0.51 points higher (equivalent to half a standard deviation in their ECD score) compared to their peers who have less than four books. The link between the ECD score and the availability of books persists even after controlling for family (wealth, language, composition), parental (education, age), and spatial (region, urban residence) characteristics, as well as time spent with electronic devices; children with more than three children's books at home score on average 0.30 points higher on the ECD scale compared with their peers with less than four books, and who have otherwise similar individual (age, gender), family, and parental characteristics. [52]

Access to children's books is also strongly correlated with literacy and numeracy, as well as social and emotional development. Among the children of a similar age and the same gender, children with more than three books in the home are twice as likely to reach literacy and numeracy as well as social and emotional development targets compared to their peers with less than three children's books in the home. The link remains strong and statistically significant after accounting for other factors; children with otherwise similar individual and family characteristics, but a greater availability of children's books at home, are 1.6 times more likely to reach literacy and numeracy targets and 1.7 times more likely to reach social and emotional development targets. [53]

52 Table 29: Summary of Regression Models with Children's Books at Home Predicting Early Childhood Development Composite Score (n=1095)
53 Table 30: Summary of Logistic Regression Models with Children's Books at Home on Literacy and Numeracy Development (n=1095) and Table 31: Summary of Logistic Regression Models with Children's Books at Home on Social and Emotional Development (n=1095)

The relationship between the availability of toys is not consistent with existing literature on the topic. There is no statistically significant association between the availability of homemade toys and the ECD score. Similarly, there is no statistically significant association between the availability of toys from a shop and the ECD score. The association of ECD score with household objects or outside objects to play with is negative and not statistically significant. Existing literature on toys at home does provide a logical explanation for the results. As evidence on the effect of toys indicates, (1) categories of toys and (2) parent-child interactions are to be accounted for when examining the effect of toys in the home.[54] Therefore, researchers and experts on the topic urge parents and agencies working with parents to acknowledge the following:

- Toys cannot be used as a substitute for parental care. One of most important qualities of educational toys is the ability to foster interactions with an adult and child together in a supportive, and unconditional play setting. [55]

- Toys should be developmentally appropriate. Parents should consider including the toys that help promote learning and growth in all areas of development, and avoid toys that discourage children from using their imaginations. Social/emotional and cognitive skills are developed and enhanced as children use play to work out real-life problems. [56]

Differences in Learning Resources at Home by Parental and Family Characteristics

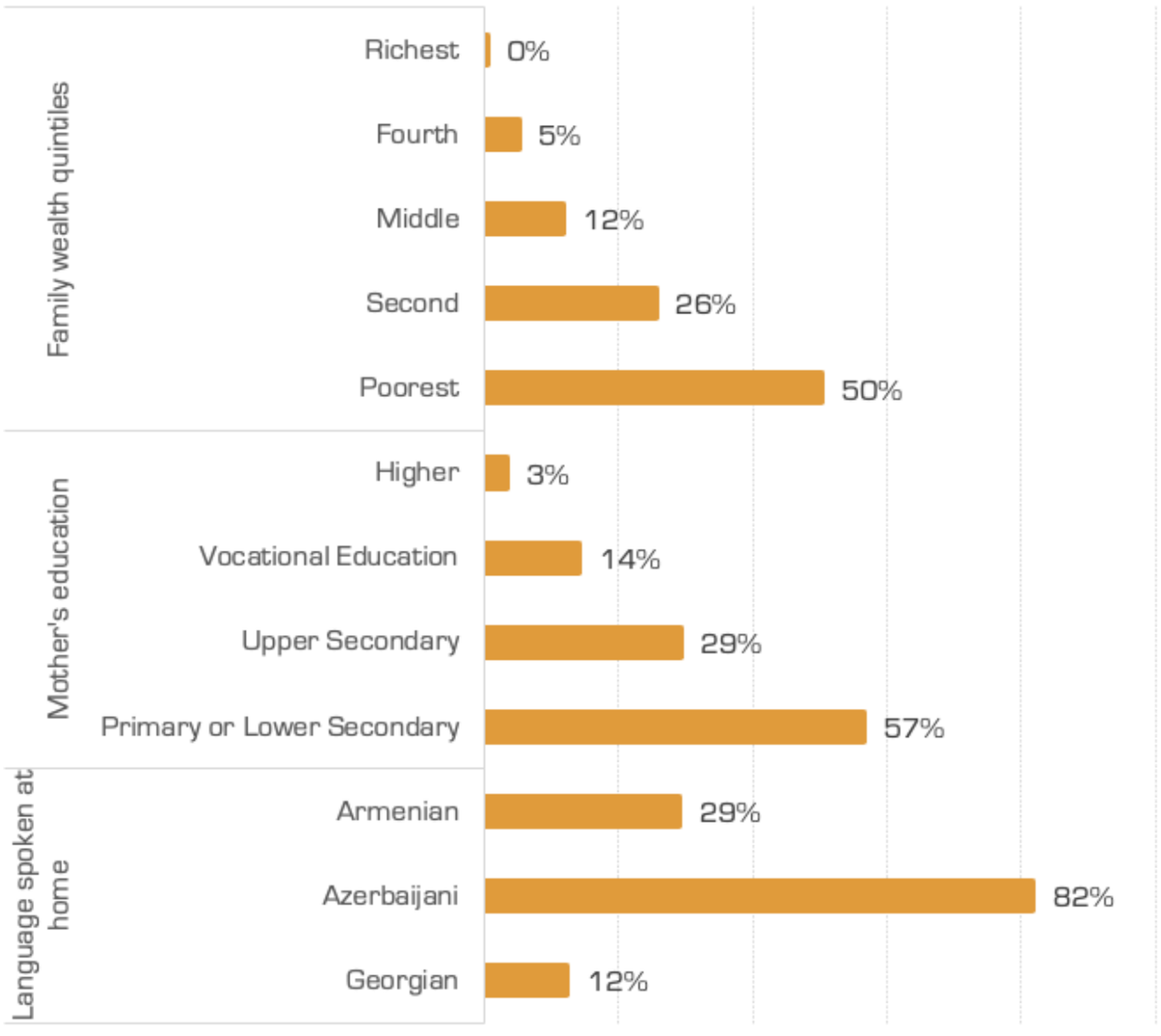
Considering the effect that access to children's books can have on a child's development, we examine the factors that could explain the variation in the availability of books.

To illustrate the existing disparities by family and contextual factors, the figure below shows the percentage of children with no children's books in the home. As the figure demonstrates, the absence of books in the home is strongly correlated with family cultural and economic indicators.

Only 3 per cent of children whose mothers have a higher education degree have no books in the home, while over half of children whose mothers have only primary or lower secondary educations have no children's books. In the poorest families, half of the children don't have any books in the home. The language spoken at home is also a strong predictor. The contrast is particularly dramatic among Azerbaijani-speaking families. Children in Adjara, Samtskhe-Javakheti, and Shida Kartli are particularly disadvantaged in this regard: after accounting for parental and family characteristics (e.g. wealth and education), children in Adjara are three times (in Samtskhe-Javakheti – 2.7 times, and in Shida Kartli – 2.5 times) more likely to not have any books in the home.

54 Glassy et al., 2003; Tomopoulos et al., 2006.
55 Shonkoff &, Phillips eds. 2000
56 Goodson & Bronson, 2002; Bronson, 1995.

Figure 9: The share of children with no children's books in the home by selected indicators



PARTICIPATION IN EARLY CHILDHOOD PROGRAMMES

During the last two decades, there has been a growing consensus around the critical role of early childhood programmes in a child's development. Research shows that participation in early learning programmes can have an immediate effect on a child's socialand cognitive development, as well as significant implications for their success at school and later in life.[57] Studies also show that early childhood programmes, including various types of childcare settings, preschool, and nursery school classrooms, vary in their effect according to the type and intensity of the programme, the child's individual characteristics and background, and the care that the child receives at home.

The MICS questionnaire for children under 5 years of age includes a question on whether the child attended any childhood education programme and if the child was attending the programme at the time. Based on the data from the survey, the chapter examines:

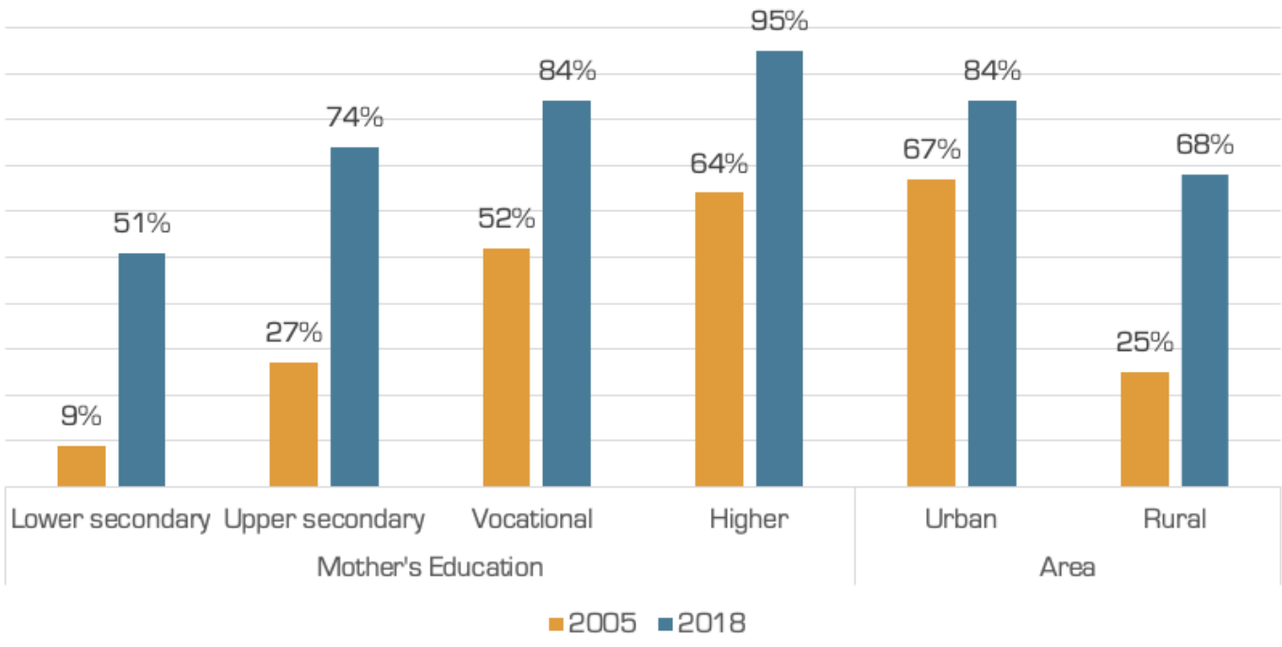
- Participation in early childhood programmes and participation trends between 2005 and 2018 by socio-economic groups and place of residence;
- The implications of ECP participation on a child's development outcomes;
- Factors explaining participation in ECP.

Participation in Early Childhood Programmes

73 per cent of children 3 years of age, 83 per cent of children 4 years of age, and 90 per cent of children 5 years of age attend early childhood development programmes. The participation rate increases with age. Research shows a similar trend in other developing countries: participation rates are higher among children 4 years of age compared to children 3 years of age. [58]

57 Yoshikawa, 1995; Figlio & Roth 2007; Jones et al., 2018; Larsen & Robinson, 1989; Barnett, 1995; Schweinhart, 2005
58 UNICEF 2010

Figure 10: Participation rates by mother's education level and urbanicity in 2005 and 2018

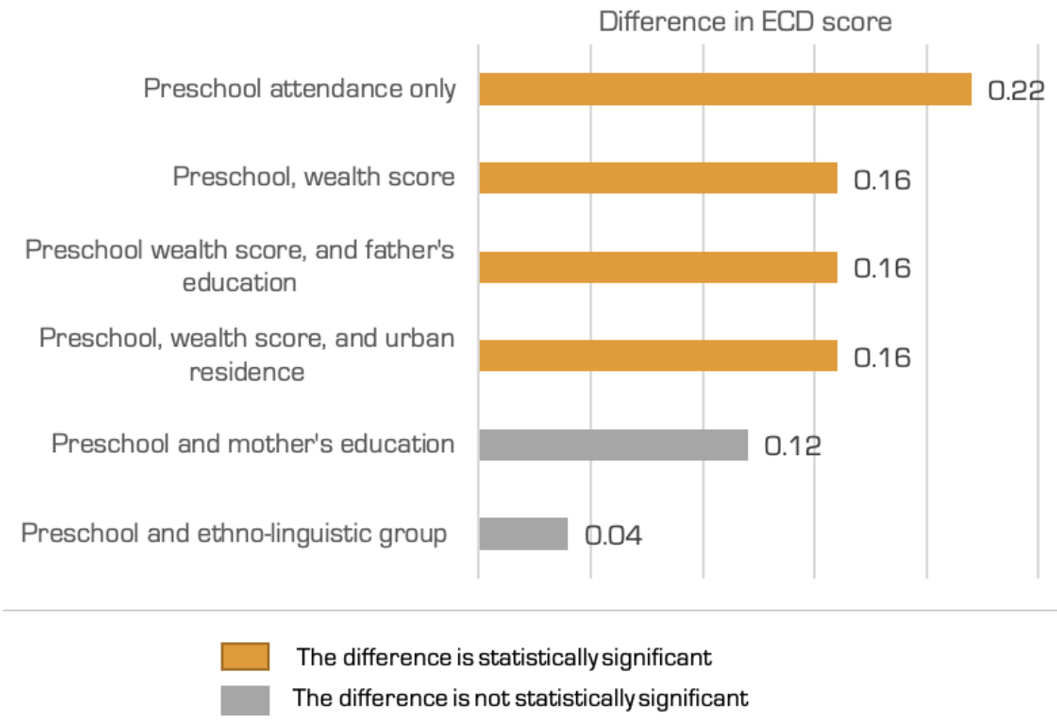


Participation in early childhood programmes significantly increased in the period between 2005 and 2018, from 45 per cent in 2005 to 78 per cent in 2018. The increase was larger among children 3 years of age. The change in the participation rate was particularly significant for children living in rural areas: the participation rate increased by 17 per cent in urban areas and by 43 per cent in rural areas. Also, the growth in participation is significantly sizable for children from more disadvantaged backgrounds: the participation rate for the children whose mothers have reached only primary or lower secondary education increased by 42 percent, and the rate increased by 47 per cent for children whose mothers achieved secondary education. The growth is 21 per cent for the children with mothers who have had a higher education, and 32 per cent for the children whose mothers have had vocational education.

The effect of early childhood programme participation on early childhood development

The data does not show a consistently strong association between early childhood attendance and child development indicators. There are differences in the composite score of early childhood development between the children who attend preschool and those who do not attend preschool. As Figure 11 illustrates, in the model where differences in age and gender are accounted for, children who attended preschool score, on average, a standard deviation of 0.22 higher compared to the children who do not participate in any formal early development programme (SE=0.07, t=3.0, p<0.01). The difference decreases, but remains statistically significant, after accounting for differences in the family wealth score (B=0.17, se=0.07, t=2.25, p<0.05), family wealth and father's education level, or wealth score and urban residence (see Figure 11). However, after accounting for the language spoken at home, the difference between the groups decreases to a standard deviation of 0.05 on the ECD score, and the difference is not statistically significant. The mother's education has a similar effect; the difference between the children who attend preschool and those who do not attend preschool should be attributed to differences in the mother's education rather than the effect of attending preschool, and for the children whose mothers have the same education, preschool participation does not affect the children's developmental outcomes. The data does not show a difference in reaching literacy and numeracy or the social and emotional development target by attendance in early childhood development programmes.

Figure 11: The association between Preschool Attendance and ECD by Control Variables[59]



The finding on the association between a child's development and preschool participation is consistent with existing evidence. While there is a mounting body of evidence on the immense implications of early childhood education and care for a child's development, the studies also underscore the importance of the quality of the programmes. Higher quality programmes consistently generate positive outcomes for children, while poorer quality arrangements have been found to have no effect on children's outcomes or even detrimental outcomes for some.[60]

Also, as evidenced by a large-scale assessment of student literacy, mathematics, and science studies in Georgia, unlike in most countries, preschool participation does not translate into better learning outcomes for Georgian students.[61] The PIRLS 2011 shows that students who had attended preschool performed higher on literacy tests in the fourth grade. The difference by preschool attendance should not be interpreted as potential impact of preschool participation. Instead, the difference is an indication of the inequality in preschool participation. The difference is cancelled out by place of residence or home resources for learning indicating that children in urban areas, and children from families with higher cultural capital (books, educated parents), are more likely to attend preschool, and vice-versa.[62] The low participation rates among more disadvantaged children, which persists to present day despite overall increase in participation rates, is particularly alarming considering the evidence indicating that preschool participation is most effective for children from lower socioeconomic backgrounds, and children who also usually lack parental support at home.

59 The models are also adjusted for a child's age (in months) and a child's sex
60 Baker et al., 2008
61 See e.g. PIRLS 2006 national report, p.53
62 Andguladze, 2016

Factors associated with participation in early childhood programmes

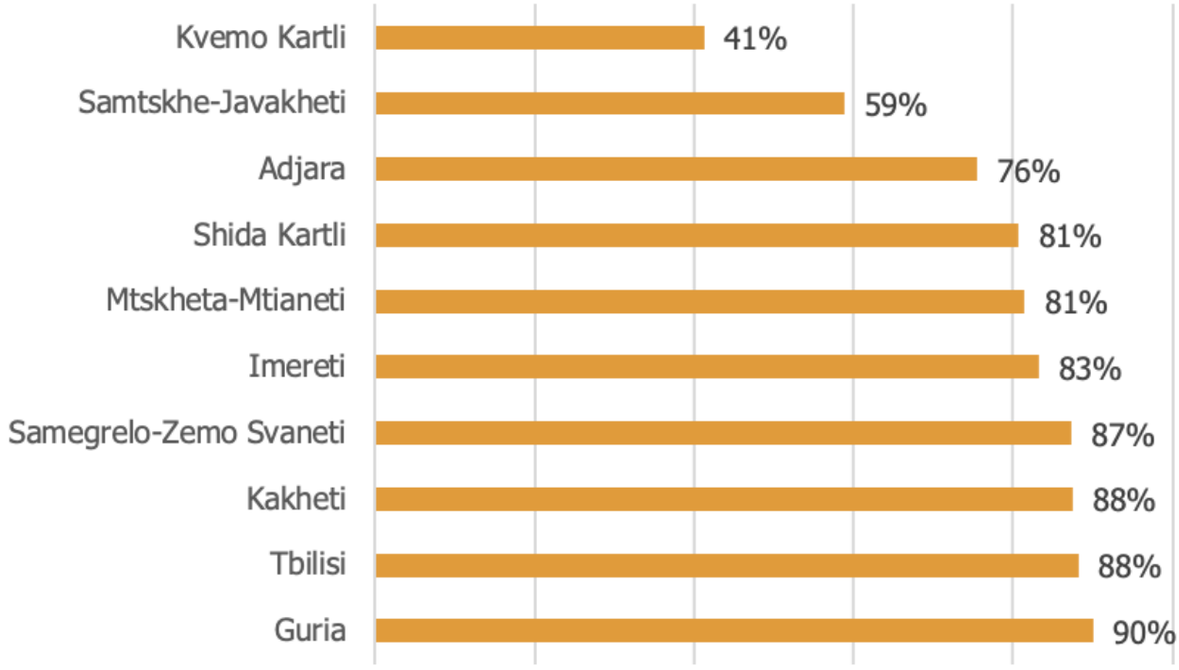
Despite an impressive increase in participation rates for less privileged social groups, both the spatial and parental background related disparities in early childhood programme attendance, however, remain significant. A multivariate analysis of preschool attendance among children between 3 and 4 years of age shows that the differences in preschool attendance is associated with:

- A child's age: as demonstrated in the figure above, the likelihood of attending a formal early learning programme increases by age (B=0.07, SE=0.01, p<0.001). The effect of a child's age remains statistically significant after accounting for place of residence and parental and family characteristics.

- A parent's education is also strongly associated with preschool attendance: only 51 per cent of children whose mothers have lower secondary education attended preschool education programmes at the time of the MICS survey, while the share of children attending these programmes, and whose mothers have vocational education, is 84 per cent; the share is 85 per cent among the children whose mothers have higher education. The differences remain statistically significant after accounting for place of residence variables (urbanicity, region) and family characteristics; the children whose mothers only have lower secondary education, compared to the children whose mothers have higher education, are 0.50 times less likely to be attending kindergarten or any other type of early childhood education programme (B=-0.67, SE=0.32, p<0.05). Similarly, a father's lower secondary and secondary education is negatively associated with the likelihood of attending preschool.

- Ethnolinguistic group: 84 per cent of children from Georgian speaking families participate in early formal learning programmes. The share of children attending such programmes from Azerbaijani speaking families is 29 per cent, and 38 per cent for children from Armenian speaking families.

Figure 12: Preschool Participation rates by region, 3 and 4 year-old children



- Regional disparities: participation rates in ECP differ by regions, with the rate in Guria being the highest (90 per cent); the lowest rates were found in Samtskhe Javakheti (59 per cent) and Kvemo Kartli (41 per cent). The differences among the regions is partially explained by the differences in participation between ethnic groups. Therefore, adjusting for the language spoken at home shows that the likelihood of children living in Georgian speaking families in Samtskhe-Javakheti is not statistically or significantly different from the children living in Georgian speaking families in Tbilisi. However, in two regions - Kvemo Kartli and Adjara - even after adjusting for differences by the language spoken at home and other family and parental characteristics, children are less likely to attend kindergarten compared to children in Tbilisi. The likelihood of attending kindergarten is 0.20 times less likely in Kvemo Kartli (B=-1.6, SE=0.3, $p<0.001$) and 0.45 times less likely in Adjara (B=-0.79, SE=0.29, $p<0.01$).

- The share of children whose mothers have functional disabilities are 2.5 times more likely (B=0.92, SE=0.44, $p<0.05$) to be enrolled in preschool compared to their peers whose mothers do not have functional disabilities, but are otherwise similar in other characteristics (e.g. mother's education, wealth score, place of residence, ethnicity).

Similar trends have been revealed among children 5 years of age. Children whose mothers have a primary or lower secondary education only are 93 per cent less likely to attend preschool compared to their peers whose mothers have higher education. Also, ECP participation rates are dramatically lower among children in non-Georgian speaking families compared to children in Georgian speaking families. The difference remains statistically significant after accounting for a mother's education, the family wealth score (B=-2.1, S.E.=0.51, Wald=16.2, $p<0.001$), and the region of residence (B=-2.35, SE=0.66, Wald=12.8, $p<0.001$). Participation rates also differ by the child's sex, with higher rates among girls (93 per cent) compared to boys (86 per cent). The difference is not random (2(1)=7.0, p=0.08), and remains statistically significant after controlling for the mother's education, family wealth, and language spoken at home. [63] ECP participation rates are particularly low in Kvemo Kartli (56 per cent) and Adjara (86 per cent).

63 Table 42: Summary of Logistic regression models on preschool participation among children 5 years of age (n=552).

CHILDREN AT RISK

Identifying the children at risk can help develop targeted interventions and policies. Understanding the characteristics of children who are more likely to fail in reaching developmental targets could help to identify the children through national and local data sources. This report examines a child's individual, family, parental, and spatial characteristics to identify the factors associated with the risk of failure in reaching development targets.

Children with Functional difficulties

Children with functional difficulties (1.3 per cent), on average, have lower ECD scores. After accounting for a child's sex and age, the difference between the children with and without any functional difficulty is 1.3 standard deviations on their ECD scores (SE=0.27, t=4.8, $p<0.001$). The difference remains statistically significant after accounting for the mother's education and the family wealth score. The children are also less likely to reach social and emotional developmental targets; accounting for the differences in age, sex, the mother's education, and the family wealth score, children with any functional difficulty are 0.13 times less likely to reach social and emotional developmental targets compared to their peers with no functional difficulties (B=-2.1, SE=0.60, $p<0.001$). The data does not show a statistically significant difference in literacy and numeracy development.

Children with Anthropometric Failures

Physical growth during the early years is critical for broader cognitive, motor, and socioemotional development. Risks associated with growth faltering include suboptimal brain, cognitive, language, and motor development.[64] These developmental deficits may persist throughout childhood and lead to poor mathematics achievement, reading comprehension, and receptive vocabulary during early years of schooling, and subsequent reductions in lifetime earnings.[65] Studies have shown that developmental problems are more likely to occur as a result of a combination of biological and psychosocial risk factors, which are often caused or exacerbated by poverty in developing country settings. [66] Therefore, in some countries, no association between cognitive and motor development and growth has been found. [67] Factors behind growth faltering are also grounded in the context and cannot be easily generalized across different economic, social, and cultural settings.[68] Therefore, the report has included children's anthropometric indicators in the analysis to discuss the prevalence of anthropometric failures in Georgia and their implications for child development outcomes.

64 National Research Council. (2000).
65 Crookston et al., 2013; Adair et al., 2013.
66 Sudfeld et al., 2018
67 Tran et al., 2019
68 Sudfeld et al., 2018.

In the MICS, anthropometric measures are collected from a subsample of the children under 5 years of age.[69] Based on the data, and following the World Health Organization, by transforming raw height and weight measurements into age and sex-specific z-scores, the following anthropometric indicators are calculated:

- Weight-for-age z-scores (WAZ) less than 2 SD are classified as wasting;
- Height-for-age z-scores (HAZ) less than 2 SD are classified as having stunting;
- Weight-for-height z-scores (WHZ) less than 2 SD are classified as underweight.
- Weight-for-height z-scores above 2 SD are classified as overweight.

Growth failure indicators in Georgia are comparable to those in the region internationally. The average share of children with wasting for Eastern Europe and Central Asia countries (EECA) is 2.0 per cent, compared to 2.1 per cent in Georgia, with 0.3 per cent compared to 0.5 per cent of children being classified as having severe wasting in Georgia and in EESA countries, respectively. The share of children with stunting is 7.7 per cent in EECA countries and 5.8 per cent in Georgia. The share of overweight children is 6 per cent in Georgia and 10.8 per cent, on average, in EECA countries.

Table 5: The share of children by anthropometric failures in Georgia

Anthropometric failures[70]		Georgia <5 years old[71]	Europe and Central Asia (2019)	WHO Cut of values
Wasting	2 SD lower	2.1%	2.0%	<2.5%- very low 2.5 to <5%: low
	3 SD lower	0.3%	0.5%	
Stunting	2 SD lower	5.8%	7.7%	<2.5%- very low 2.5 to <10%: low
	3 SD lower	1.3%		
Overweight	2 SD Above	6.0%	10.8%	<2.5%- very low 2.5 to <5%: low
	3 SD Above	0.8%		

69 The children's height and weight were objectively measured by field assessment teams. Weight was measured using electronic scales and height was measured using adjustable measuring boards. Standing height was obtained for children under 5 years of age.
70 World Health Organization 2020.
71 World Health Organization 2019.

According to the World Health Organization cut-off points, the percentage of children exhibiting wasting puts the country in the "very low public health significance" category, the share of stunted children into the "low public health significance" category, and the share of overweight into the "medium public health significance" category (Table 5).

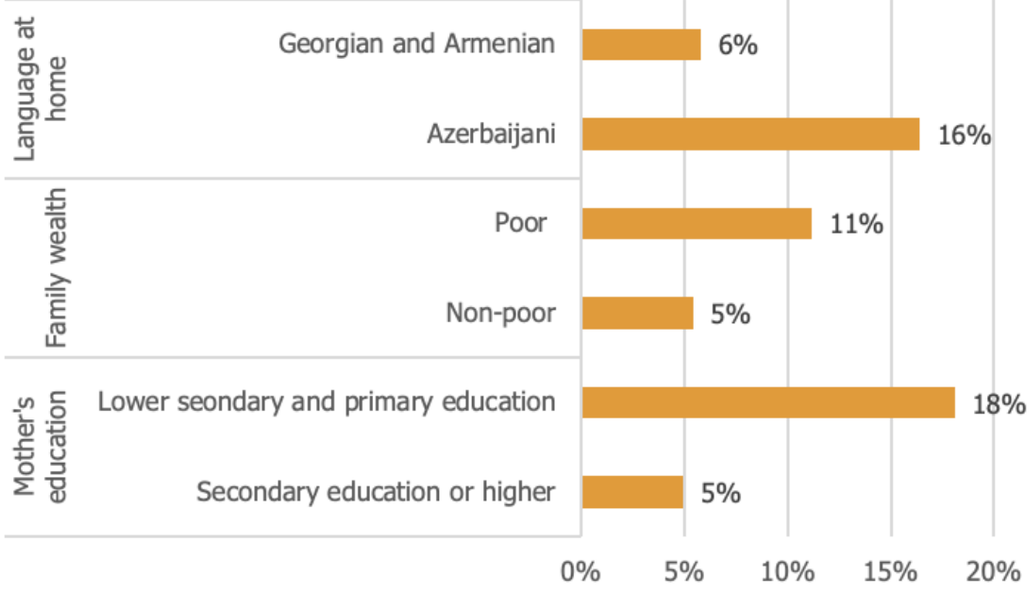
Wasting: Wasting in children is a symptom of acute undernutrition, usually as a consequence of insufficient food intake or a high incidence of infectious diseases, especially diarrhoea. Wasting, in turn, impairs the functioning of the immune system and can lead to increased severity and duration of, and susceptibility to, infectious diseases and an increased risk for death.

Among children between 3 and 4 years of age in Georgia, wasting is statistically significant and associated with ECD and socio-emotional development. Children with a wasting score on 0.70 points lower on the ECD composite scale (SE=0.22, t=3.2, p<0.01) are 0.33 times less likely to reach the social and emotional development target (B=1.12, SE=0.51, 0<0.05).

Stunting is relatively more frequent among Georgian children: 5.8 per cent of children are stunted including 1.3 per cent of children who are severely stunted. According to the WHO, children who suffer from growth retardation as a result of poor diets or recurrent infections tend to be at greater risk for illness and death. Stunting is the result of long-term nutritional deprivation and often results in delayed mental development, poor school performance, and reduced intellectual capacity. Young children with a stunted growth score perform 0.43 points lower on the ECD composite scale (SE=0.14, t=3.2, p<0.01). Children with stunting are also 0.39 times less likely to have reached literacy and numeracy development targets (B=0.95, SE=0.44, p<0.05) and 0.39 times less likely to have reached social and emotional development targets (B=0.84, SE=0.36, p<0.05).

The share of children with stunting differs by the mother's education level, family wealth score, and ethnolinguistic background. The share of children with stunting is 18 per cent among children whose mothers have achieved lower secondary education, compared to 5 per cent among children whose mothers have achieved secondary education or higher; the share of stunting among children from the lowest wealth quintile is 11 per cent compared to 5 per cent among higher wealth quintiles.

Figure 13: Differences in the share of stunting by mother's education level, family economic status, and language spoken at home



Overweight: 6 per cent of Georgian young children are moderately overweight including 0.8 per cent of severely overweight children. These children are 2.5 times more likely to be on track in literacy and numeracy development (B=0.92, SE=0.31, p<0.01) and score a standard deviation of 0.43 higher compared to their peers who are not overweight. However, according to the WHO, childhood obesity is associated with a higher probability of obesity in adulthood, which can lead to a variety of disabilities and diseases, such as diabetes, cardiovascular diseases, stroke, musculoskeletal disorders - especially osteoarthritis, and cancers of the endometrium, breast, and colon.

Although early childhood obesity has not been directly linked to early childhood development, studies show that children who are overweight during their early childhood are more likely to stay overweight during their later years of childhood. [72] As they get older, children with obesity tend to show low cognitive performance. A recent study on 3,190 children between 9 and 10 years of age has linked low working memory, documented in previous studies with the thinning of the cerebral cortex, to overweight children.[73]

The likelihood of being overweight at a young age is associated with place of residence and the mother's education; children in Tbilisi are 0.27 times less likely to be overweight compared to children outside Tbilisi (B=-1.3, SE=0.47, p<0.01), and children whose mothers have achieved only a lower education level are 2.5 times more likely to be overweight (B=0.8, SE=0.39, p<0.05). Obesity is also related to the time children spend with electronic devices. Controlling for a child's age and sex, children with higher exposure to media are 2.5 times more likely (B=9.4, SE=0.3, p<0.01) to be overweight compared to children with a lower exposure to media.

Environmental Factors

Exposure to toxic chemicals: In MICS 2018, venous blood was collected from 1,578 randomly selected children between 2 and 7 years of age, across Georgia. The blood was tested for the concentration of various chemicals. The tests showed the prevalence of a high lead concentration in the children's blood. 41 per cent of children had blood lead levels greater than or equal to 5 micrograms per decilitre, and among them, 16 per cent of children had blood lead levels of greater than or equal to 10 micrograms per decilitre.

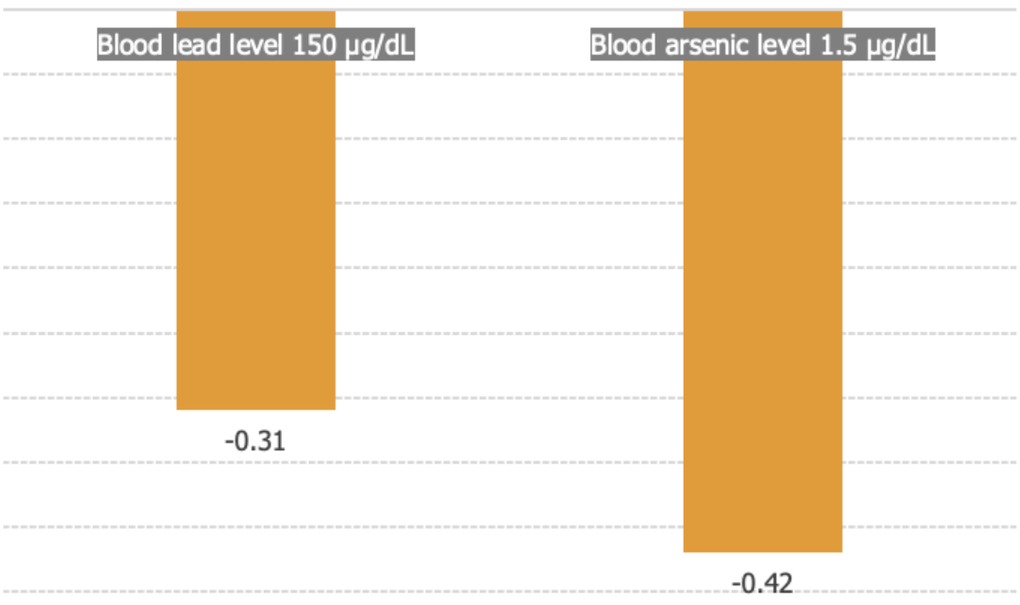
Following overwhelming evidence linking blood lead level concentration with child development outcomes, we examine the associations between them. The data does not show statistically significant differences by threshold levels (5 µg/dL and 10 µg/dL). However, accounting for differences in maternal education, family wealth score, language spoken at home, and place of residence, children whose blood lead concentration is over 15 µg/dL score on average 0.31 points lower on the standardized ECD scale compared to the children with similar characteristics but a lower lead concentration in their blood (SE=0.15, t=2.02, p<0.05). [74] These children are also 2.5 times less likely to reach social and emotional development targets (B=-1.05, SE=0.42, p<0.05)[75]. The association between blood lead level and literacy and numeracy development is not statistically significant. [76]

72 Nader et al., 2006
73 Laurent et al., 2020
74 tion between Arsenic concentration, blood lead level, and ECD
75 and emotional development
76 able 46: Summary of logistic regression models on association between Arsenic concentration, blood lead level, and literacy and numeracy development

The findings are partially consistent with existing research. On one hand, the data does show a statistically significant association between exposure to toxic chemicals and a child's development. However, other studies reveal the impact at much lower concentrations for both lead and arsenic. The studies, however, use more objective diagnostic tests to measure a child's development (e.g. Wechsler Preschool and Primary Scale of Intelligence [WPPSI-R]), which could be more effective in identifying developmental impairments compared to a parent/caregivers' subjective assessment. Therefore, the results of the study should by no means be interpreted as indicative of specific harmful thresholds for arsenic or lead concentrations, but rather the confirmation of existing evidence of a threat that exposure to toxic chemicals poses to children.

The highest share of children with a blood lead concentration over 150 µg/dL live in Adjara (31 per cent), Guria (15 per cent), and Imereti (12per cent).

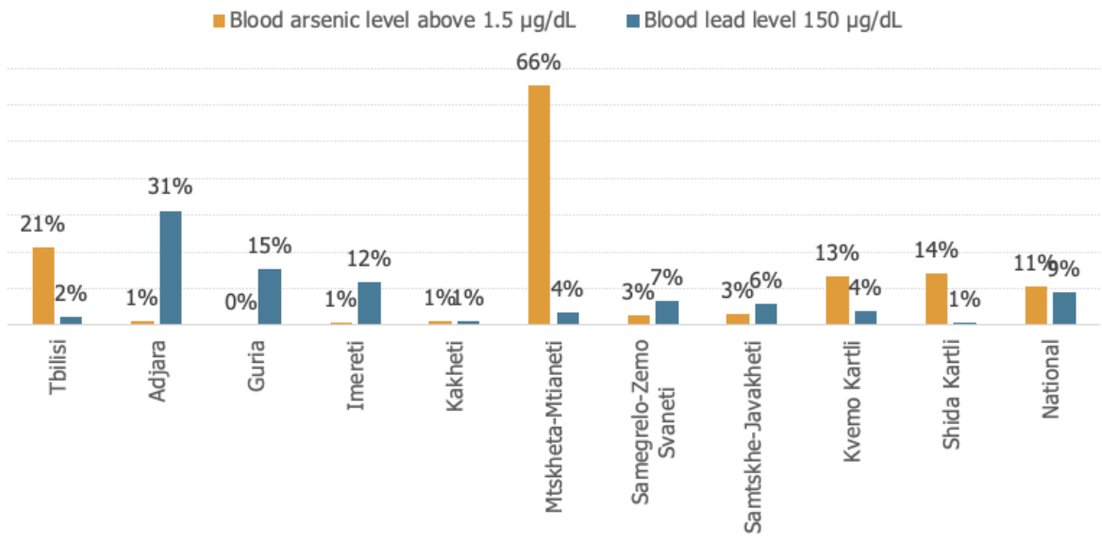
Figure 14: Association between ECD and arsenic and lead exposure among children between 3 and 4 years of age



A high arsenic concentration in the blood is usually caused by water contamination. Studies have shown that children with a high exposure to arsenic demonstrate significantly poorer performance on intelligence tests examining long-term memory and linguistic abstraction, poorer verbal comprehension scores, and general intellectual functioning, as well as attention impairment.[77] Consistent with the existing evidence, we find strong association between ECD scores and arsenic exposure. The differences between the children with a high arsenic concentration (above and below 1.5 mg/ml) are statistically significant and persist after accounting for parental and family characteristics (e.g. family wealth, language, place of residence, maternal education, and urbanicity). Children with blood arsenic concentrations above 1.5 mg/ml score on average 0.41 points lower on standardized ECD measures compared to children with a below 1.5 mg/ml concentration (SE=0.20, t=0.2, $p<0.05$), and are five times less likely to reach literacy and numeracy development targets (B=-1.6, SE=0.8, $p<0.05$)[78] and social and emotional development targets (B=-1.7, SE=0.5, $p<0.05$). [79] The share of children with higher arsenic concentrations is highest in Mtskheta-Mtianeti (66 per cent), Tbilisi (21 per cent), Shida Kartli (14 per cent), and Kvemo Kartli (13 per cent) (Figure 15).

77 Calderon et al., 2001 ; Wasserman et al., 2011 ; Wasserman et al., 2004 ; Rodríguez-Barranco et al., 2016
78 e 46: Summary of logistic regression models on association between Arsenic concentration, blood lead level, and literacy and numeracy development
79 able 45: Summary of logistic regression models on association between Arsenic concentration, blood lead level, and social and emotional development

Figure 15: Share of children under 5 years of age living in households with drinking water where Arsenic concentration is above 5 mg/L (n=1043) and blood lead level concentration is above 15 µg/dL (n=1045)



Family background

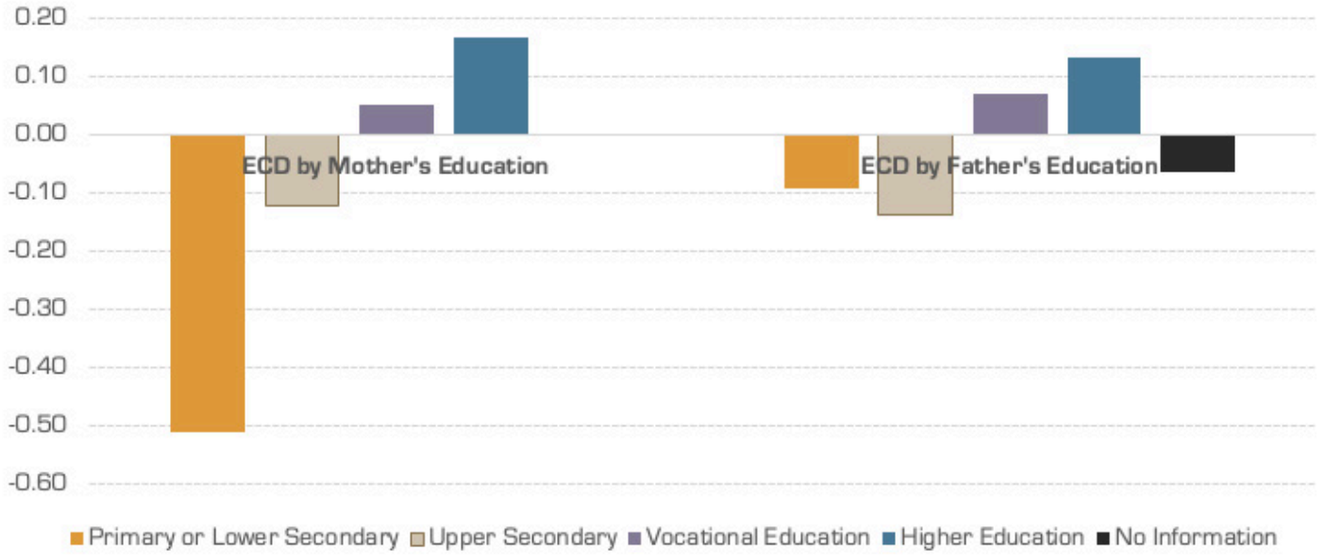
The effect of family background is acknowledged to be one of the best factors in determining a child's development. Family background characteristics are strongly associated with the kind of resources - including time, money, psychological and human capital – that a family can invest in a child's development. [80]More educated parents and those with higher economic status are more likely to possess these resources associated with a child's development. A mother with little education may not provide many learning experiences because she herself is barely literate. The poorer mother may not be able to buy books or does not even have friends and extended family (social capital) to borrow books. Considering the dramatic effect of family background, in order to identify risk groups, we observe the differences in ECD indicators by family background characteristics.

Family's economic background: For family economic background, the MICS survey provides data on household wealth, a variable with several items, such as: main material of dwelling floor, number of rooms in dwelling, main source of drinking water, toilet facility used, if the household has electricity, radio, television, or refrigerator, if a member of the household owns a bicycle, motorcycle, or car, and type of main cooking fuel used in the household. The measure is then divided into quintiles within each country: the poorest as the lowest quintile (18 per cent), second poorest quintile (19 per cent), middle (23 per cent), fourth quintile (22 per cent), and the richest quintile (19 per cent). The data does not show statistically significant differences among third, fourth and fifth wealth quintiles. However, the poorest children are a standard deviation of 0.43 lower (SE=0.10, t=4.4, p<0.001) compared to their peers from the richest quintile. The difference between the middle group (combining quintiles 2 through 4) and the richest group is a standard deviation of 0.18 in the ECD composite score (SE=0.08, t=2.3, p<0.05). The difference remains statistically significant after accounting for location factors (region and urbanicity). However, the link between wealth score and early childhood development score is cancelled out by the mother's education level indicating that (1) the mother's education level is correlated with wealth score – on average, the higher the mother's education, the higher the family wealth score and (2) among the children whose mothers have the same education, wealth score does not make a statistically significant difference. [81]

80 Haveman & Wolfe, 1994

81 Table 51: Summary of Multiple Regression Models on Association between Wealth Score and Early Childhood Development Composite Score, Table 52: Summary of Multiple Regression Models on Association between Wealth Groups (poorest, middle, richest) and Early Childhood Development Composite Score

Figure 16: Early Child Development Composite Score by Parental Education Level



Mother's education level (only primary or lower secondary [11 per cent], secondary [24 per cent], vocational [23 per cent], or higher [43 per cent]) is a strong predictor of a child's early development composite score and its subcomponents. As illustrated in the figure above, children whose mothers have reached only secondary education or lower secondary education perform well below the national average. The difference among children by their mothers' education persists even after accounting for the difference in other characteristics, such as family's wealth score, language spoken at home, place of residence, and father's education level. [82]

Among subcomponents of early childhood development, the effect of the mother's education level is more pronounced on literacy and numeracy development. Compared to children whose mothers/caregivers have reached lower secondary education only, children whose mothers have higher education degree are three times more likely to reach literacy and numeracy development targets. Similarly, the effect of a mother having a vocational education results in a 2.5 times higher likelihood of reaching literacy and numeracy development targets. The effect of mothers having a secondary education reflects a 2.3 times higher likelihood of reaching these targets. In the case of social and emotional development, the difference is statistically significant only between higher education versus lower secondary education. The difference among other groups is not statistically significant. [83]

Father's education: 10 percent of fathers have lower secondary or primary education, 29 per cent of fathers have secondary education, 11 per cent have vocational education, and 37 per cent have higher education. No information was provided on 13 per cent of children's fathers' education. Although the mothers' education is a stronger predictor of a child's development, paternal education also shows some effect on a child's development. There are statistically significant differences in ECD indicators based on the fathers' education. Specifically, a father having higher education (compared to lower secondary education only) is associated with a 0.22-point difference in the composite score of early childhood development (SE=0.11, t=2.1, $p<0.05$). The difference between other groups is not statistically significant. The effect of a father's education fades out after adding the composite wealth score to the equation. [84] Differences in socio-emotional and literacy and numeracy development by paternal education are not statistically significant.

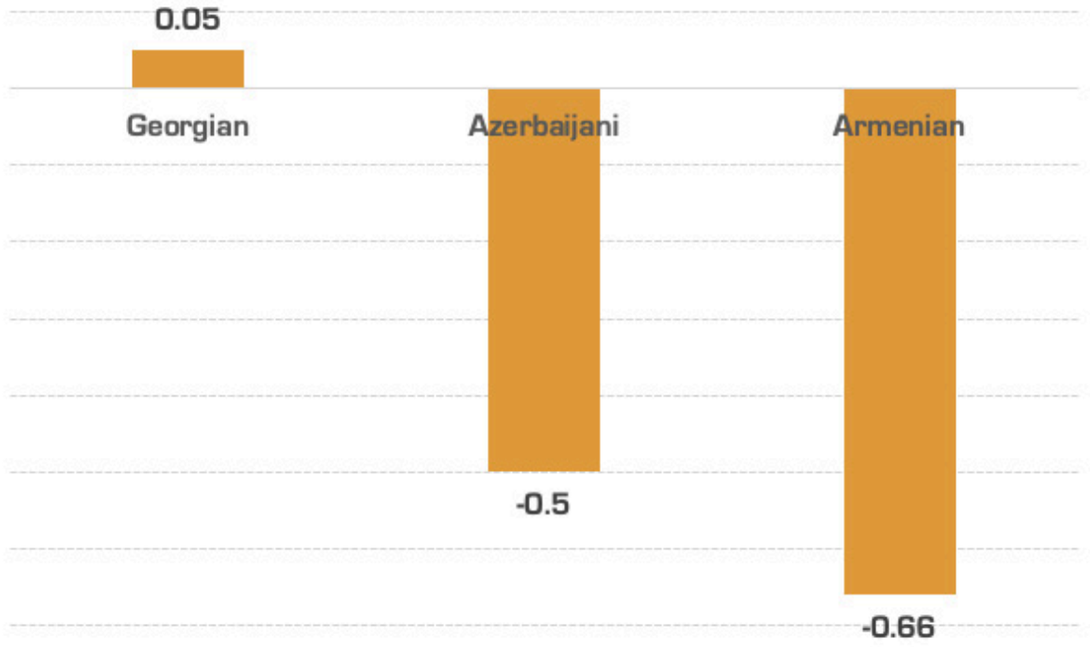
82 Table 47: Summary of Multiple Regression Models Predicting Early Childhood Development Composite Score by Mother's Education
83 Ibid.
84 able 49: Summary of Multiple Regression Models Predicting Early Childhood Development Composite Score by Father's Education

The mother's age at the time of the child's birth (min=15, max=44, mean=27, SD=5.7) is statistically significant and associated with the composite indicator of a child's development. However, the association appears only after accounting for the difference in the mother's education; children whose mothers' age at birth was above 30 years, score lower compared to the children of younger mothers with similar educational attainment. We divide the mother's age at the time of the child's birth into three groups: under 19 years of age, between 19 and 25 years of age, between 26 and 30 years of age, and over 30 years of age. Compared to the latter group, after accounting for a child's individual, parental, family, and place of residence variables, the children in the group whose mothers gave birth under 19 years of age score on average a standard deviation of 0.33 higher (se=0.17, t=2.0 $p<0.05$), the children with mothers between 19 and 25 years of age score 0.24 points higher (se=0.08, t=3.0, $p<0.01$), and the children with mothers between 26 and 30 years of age score 0.19 points higher (se=0.08, t=2.3, $p<0.05$).

Ethnolinguistic background: The report uses the language of the interview with mother/caregiver as a proxy for ethnicity. The survey covers three main groups: Georgian, Azerbaijani, and Armenian. The difference between Armenian and Azerbaijani speaking children is not statistically different. However, the report finds statistically significant differences in ECD score between Georgian and non-Georgian speaking children. Namely, compared to their Georgian speaking peers, Armenian speaking children score a standard deviation of 0.71 (SE=0.21, $p<0.01$) lower, and Azerbaijani speaking children score 0.56 points lower (SE=0.12, $p<0.001$) on the ECD composite index. The differences between Georgian and Azerbaijani and Armenian speaking students persists after accounting for place of residence, parental, and family characteristics. [85] The data do not show statistically significant differences by ethnolinguistic groups in literacy and numeracy development or in social and emotional development.

The IDP status of the household head or the mother of the child is not associated with statistically significant differences in child development indicators.

Figure 17: Mean differences in ECD by ethnic groups

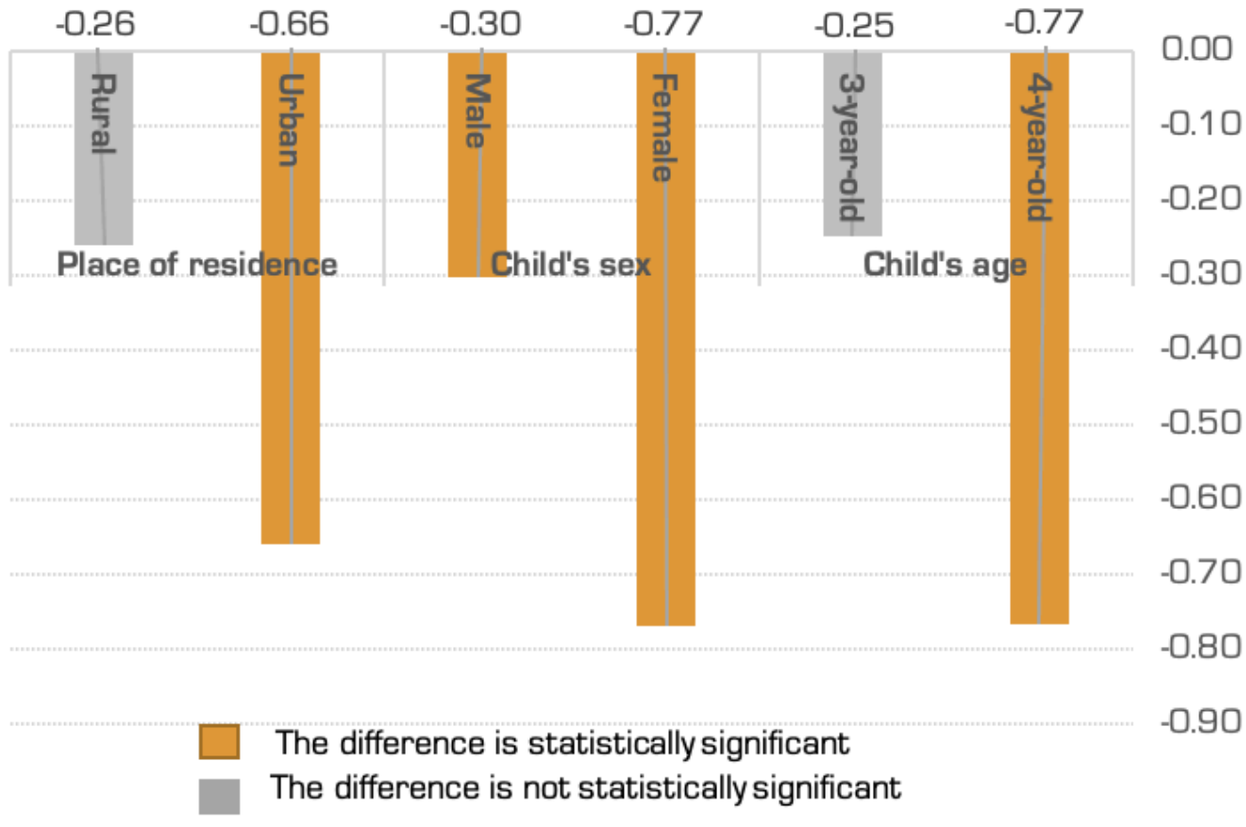


85 Table 53: Summary of Multiple Regression Models on association between Language Spoken at Home and ECDI

A caregiver's functional disability is a strong predictor of early development. Around 8 per cent of children under 5 years of age live with caregivers with functional disabilities. These children score on average a standard deviation of 0.54 lower compared to other children ($t=4.9$, $p<0.001$). The effect persists after accounting for differences in parental and family characteristics, place of residence, as well as a child's individual characteristics. [86] The effect of a caregiver's functional disability on a child's development is more pronounced among 4-year-old children than younger children, among girls compared to boys, and among children living in urban areas compared to those living in rural areas (Figure 18).

Family configuration has been linked to a child's development.[87] Namely, studies have shown that children with single parents have less parental time available to them. [88] Living in a multigenerational household can translate into more time and other resources for children.[89] The relationship stands ture if grandparents can help with care and do not require care themselves. [90] Therefore, the study has examined the relationship between a child's development indicators and some of the family composition variables (e.g. marital status of the mother/caregiver, father living in the family, number of adults in the household, number of children in the household).

Figure 18: The Differences in the Effect of a Caregiver's Functional Disability on ECDI by a Child's Age, Sex, and Place of Residence



86 Table 56: Summary of Multiple Regression Models on ECDI with Caregiver's Functional Disability as a Predictor Variable
87 Dandes & Dow 1969; Laosa & Brophy, 1972; King & Seegmiller, 1973
88 Hill & Stafford, 1980; Nock & Kingston, 1988
89 Furstenberg, 1976; Furstenberg et al.,1987
90 Chase-Lansdale et al., 1994

The data does not show statistically significant differences based on mother/caregiver, marital status, and father's presence in the family. There is no direct effect of family size on a child's development indicators. There is, however, a statistically significant difference between the number of other children in the family and a child's development indicators. Being the only child in the family is associated with a child's literacy and numeracy development, but not social and emotional development. The difference persists after accounting for the mother's characteristics (education, marital status, age), the father's education, the language spoken at home, the family wealth score, and the place of residence. Firstborns in the family are 1.9 times more likely to reach the literacy and numeracy development target (B-0.64, SE=0.19, p<0.001). Apart from parental time available for the child, the result could also be explained by the evidence from other studies on the effect of birth order on intelligence. [91]

Spatial Differences in Early Childhood Development Outcomes

As documented through a decade of education assessments, children and youth in Georgia show stark differences by their place of residence. An international assessment of student learning (PIRLS, TIMSS, PISA), as well as the National Assessments in student achievement, show that starting from the early years of schooling, students' learning outcomes differ by regions and urbanicity in reading, mathematics, and science performance, with higher learning outcomes in cities and lower outcomes in small towns, villages, and remote rural schools. [92] The differences among regions and by urbanicity is also consistent with child development models underscoring the importance of exosystems and macrosystems in a child's development. In other words, the effect of a region and a type of settlement represents built in economic, social, and cultural differences. Some of the distinctions can be attributed to inequality in the system demonstrated by the differences in the resources available to families in Tbilisi compared to the resources available in small towns; other disparities can be related to the cultural differences between regions. Growing empirical research provides strong evidence to suggest that the social, economic, and cultural characteristics instil important, sometimes life-long foundations for a child's development.

The MICS data includes two variables on the place of residence: area is a dummy variable indicating a child's place of residence being either urban or rural. The region variable has 10 categories including all regions in the country except for the occupied territories. Based on the MICS data, the report discusses the differences in child development outcomes by region and urbanicity, accounting for the differences in a child's individual, family, and parental characteristics.

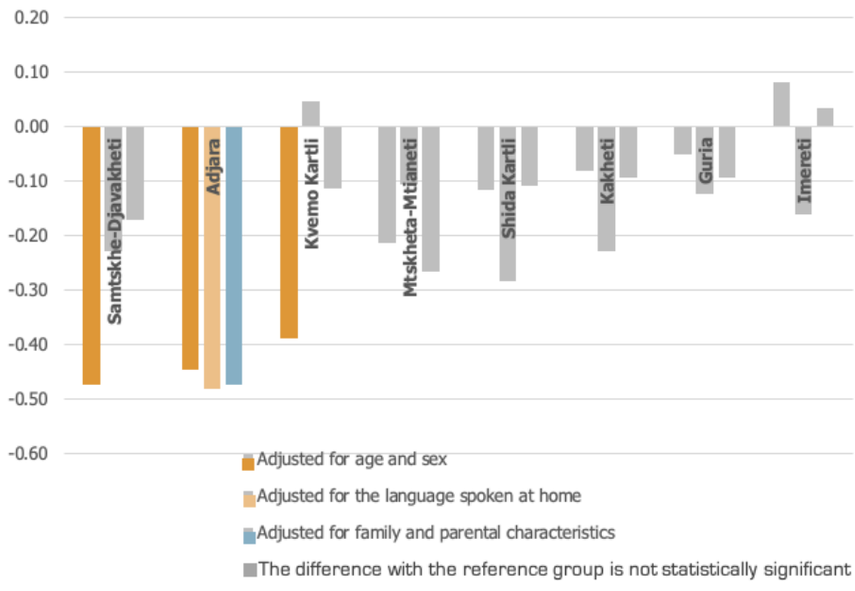
On average, children in Samtskhe-Javakheti, Adjara, and Kvemo Kartli score significantly lower compared to their peers in Tbilisi and other regions. Compared to their peers of the same gender in Tbilisi, children in Samtskhe-Javakheti score, on average, a standard deviation of 0.47 lower (SE=0.18, t=2.6, p<0.001), children in Adjara score 0.45 points lower (SE=0.10, t=4.4, p<0.001), and children in Kvemo Kartli score 0.39 points lower (SE=0.11, t=3.65, p<0.001).

The differences in ECD score of children between Tbilisi and two other regions – Samtskhe-Javakheti and Kvemo Kartli - are largely accounted for by differences in ECD scores among Georgian speaking children and children speaking in ethnic minority languages. As Figure 19 illustrates, after adjusting for the language of the interview with the child's mother, the differences between Tbilisi and Samtskhe-Javakheti and Tbilisi and Kvemo Kartli are no longer statistically significant. The data do not show statistically significant differences in social and emotional development by regions.

91 Kristensen & Bjerkedal, (2007)
92 See e.g. National reports on PIRLS 2011, TIMSS 2011, PISA 2018 and National Assessments in Mathematics (2018) and Sciences (2016).

The difference between Adjara and Tbilisi remains statistically significant even after accounting for the differences in family wealth, mother's education, father's education, and family composition. This finding implies that the differences between the children in Adjara and Tbilisi should be explained by some other factor which has not been accounted for in the analysis.

Figure 19: Differences in ECDI between Tbilisi (reference group) and other regions



Literacy and numeracy development also differ by regions. Compared to children living in Tbilisi, children in Adjara are 0.56 times less likely to reach development targets in literacy and numeracy (B=-0.58, SE=0.27, $p<0.05$), and children in Shida Kartli are 0.40 times (B=-0.90, SE=0.35, $p<0.01$) less likely to reach these targets. The differences remain statistically significant after accounting for differences in parental and family characteristics and urbanicity.

Social and emotional development also differs by regions. Children in Adjara are significantly less likely to reach social and emotional development targets compared to their peers in Tbilisi and Imereti. The differences are not affected by accounting for the differences in parental and family characteristics. Children in Kvemo Kartli are also significantly less likely to reach the social and emotional development target. The effect of place of residence, however, as in the case of the composite indicator of early development, is cancelled out by accounting for the language of the interview with the child. Similar to the other two development indicators, the difference in the share of children reaching social and emotional development targets between children living in rural and urban areas is not statistically significant.

The difference by urbanicity in the early childhood development composite score is significant; children in urban areas score, on average, higher compared to their peers in rural areas (B=0.16, SE=0.06, t=2.6, $p<0.01$). However, the difference loses statistical significance after adjusting for the mother's education level, indicating that the difference between children living in rural and urban areas can be explained by differences in a mother's education level. The difference in literacy and numeracy development by urbanicity is also statistically significant. However, adding family configuration variables (e.g. number of adults, number of children under 5 years of age, number of children between 5 and 17 years of age) cancels out the effect of urbanicity. [93] The difference in social and emotional development between the children living in rural and urban areas is not statistically significant.

93 59: Logistic regression models on Literacy and Numeracy Development with Place of Residence (Urban/rural and Region) as Predictor Variables

RECOMMENDATIONS

Parent education

Many believe that good parenting is a relative concept and what is good for one child can be detrimental or ineffective for another. Some anthropologists even reject the idea of universal concepts of good parenting arguing that human behaviour can be understood only in the context of the culture in which it occurs and that child-rearing practices tend to be highly specific and deeply influenced by tradition and societal context. Also, there might be some disagreements about certain caregiving techniques. However, our study shows that some principles of good parenting seem to be valid across cultures. Consistent with research from other countries, good parenting is not consistent with aggressive discipline; young children in Georgia who are subject to violent psychological or physical punishment tend to show lower developmental outcomes. Children respond to the stimulating learning environments provided by their parents as well as other members of the family. The time invested in supporting a child's learning – reading with them, telling stories – translates into better developmental outcomes. Therefore, the lack of paternal engagement, including the gender bias in paternal child caregiving practices, evidenced from the study needs to be addressed. The role of other adults in a child's development (e.g. grandparents) challenges state and non-state actors to find ways to include extended family members in parental education interventions; existing evidence from other studies also suggest that the potential role of grandparents to step in, support, and help guide children should be recognized. [94] The linkage between the time that parents spend with their children and the time children spend with computers indicates that parents seem to be substituting parenting time for electronics time without considering the negative impact that spending too much time with those electronics can have on a child's development. The study also shows that some parenting practices do not produce the expected results. For example, as evidenced from our study, playing with children does not have a positive impact on young children. However, there is a wealth of evidence that highlights the importance of play with parents for a child's development. This contradiction could imply that a parent's perception of playing with children is not informed by the basic principles of effective playtime with their children.

The findings on parenting practices indicate that parental education, like in many countries, should be on the policy agenda for relevant state and non-state stakeholders. Although effective preschool interventions can help to partially compensate for the lack of home learning activities, studies suggest that effective parental engagement surpasses the effect of efforts invested in by preschool teachers. For example, an influential experimental study on the relative efficacy of parent and teacher involvement in a shared-reading intervention for children, between 3 and 4 years of age and from low-income backgrounds, tested for the differences between three scenarios: a school condition in which children were read to by their teachers in small groups, a home condition in which children were read to by their parents, and a combined school plus home condition. Parents and teachers were trained in a specific form of interactive reading via an instructional videotape. The intervention lasted six weeks. The differences between pre-test and post-test results for the groups revealed that the effects were largest for children in conditions involving home reading. [95]

94 Hagestad, 1985
95 Lonigan & Whitehurst, 1998

Considering the importance of parental engagement, Georgian parents as well as extended family members need to be educated about child development principles and techniques including the development of children's literacy and numeracy skills, the social and emotional development of child, positive disciplinary practices, selecting developmentally appropriate toys, and potential risks associated with excessive exposure to media.

Parent education is "the purposive learning activity of parents who are attempting to change their methods of interaction with their children for the purpose of encouraging positive behaviour in their children". [96]Some researchers claim that the first parental education programmes go back to the beginning of the 19th century. [97] Therefore, a large body of evidence has been accumulated that allows us to consider a wide array of parent training programmes and reflect on their effectiveness. The research suggests that apart from the content of parent training programmes, the modality of the training programmes should be carefully considered.[98] According to their modalities, parent training programmes can be grouped into the following categories:

- Self-administered parent training may offer an accessible intervention for many families, especially those that have difficulty participating through traditional means. By providing parents with printed or online literature, and video or audio resources through mass media, this mode of delivery requires little to no contact between the professional and the parent. Self-administered intervention has been shown, by some research, to be as effective as therapist directed programmes. [99] Webster-Stratton, Kolpacoff, and Hollinsworth (1988), on the other hand, found this mode of intervention delivery to be less effective when compared to a group discussion videotape modelling programme. In a follow-up study, Webster-Stratton (1999) recognized the importance of allowing families access to more cost-effective programmes and sought to determine which participant variables were associated with positive outcomes in self-administered programmes. Results of Webster-Statton's study suggested that single-mother status, maternal depression, and a mother's low mental age were significantly correlated with at least two of the four outcome variables at post-treatment. Therefore, although a self-administered intervention may be helpful for some families, others may not respond to this form of intervention and may need additional support.

- Group-Based Programmes using a small-group format (8–12 participants) allows families to receive more therapist attention in comparison to a self-administered format. Although group-based programmes require more resources to implement, they are still more cost efficient than individually delivered interventions.

  Several group parent education programmes have been designed to promote parent competencies and to address and/or prevent conduct problems. 100 An additional benefit of group programmes is the support and kinship available from other participants, possibly increasing parental engagement with the intervention and the children's early education programme. Greater parental engagement is an important benefit of group formats, especially for those who may be socially isolated (e.g., low-income single mothers), with little support and few friendships. [101] The effect of group discussion has been studied since the 1940s, and their superiority over presentations has been documented in several seminal works. [102]

96 Croake, J. W., & Glover, K. E. (1977). A history and evaluation of parent education. Family Coordinator, 151-158. p.152
97 Croake & Glover, 1977.
98 McIntyre & Phaneuf 2008
99 Markie-Dadds & Sanders, 2006; Nicholson & Sanders, 1999
100 Brestan & Eyberg, 1998; Webster-Stratton & Taylor, 2001
101 Dumas & Wahler, 1983
102 See e.g. works of Kurt Lewin on group discussion and group dynamics;

The basic principle behind group discussions is reflection and participation contributing to the higher chance of adopting the practice (e.g. a specific parenting practice) during a group meeting. [103]

Although group-based parent education programmes have many advantages, not every family benefits from this approach. [104] Some parents react more to individual consultations. Moreover, for group meetings to be effective in helping parents to change their parenting habits and practices, highly qualified facilitators are required. [105]

- Individually Administered Programmes have many advantages over self-administered or group-based programmes. In individually administered programmes, there is increased flexibility in scheduling sessions and an individualization of the content. Professionals, be it social workers or preschool staff, can provide individualized feedback specific to their situations and address parents' questions and concerns in a more individualized, tailored fashion. The primary disadvantage of individually administered programmes is the cost. On the other hand, parents were more likely to accept and participate in individually based intervention than in group intervention. [106] However, as in the case with the other models, the effectiveness of individual models differs by the characteristics of its target groups. In a meta-analysis examining the variability of treatment effects in terms of participant and treatment characteristics, the authors found the individually delivered interventions to be superior to the group-delivered interventions for financially disadvantaged groups. That is, families with a low socioeconomic status that participated in individually delivered parent programmes had larger treatment effects than those that participated in group-delivered programmes, which suggests a greater need for more individualized support for these individuals. [107]

Apart from the three main types of parental education models, some research also suggests that a combination of individual in-person meetings together with self-administered predesigned training materials, group-based trainings, and individualized video feedback are particularly useful for parents who have children with behavioural problems. [108] The training model should be selected depending on the needs of the target groups, such as low SES parents, or parents of children with disabilities or behavioural problems.

In some countries, pediatricians are assigned some of the role to promote the child's well-being and to help parents raise healthy, well-adjusted children. Pediatricians, therefore, can play an important role in the prevention of child maltreatment. There is a growing body of literature and research focused on training pediatricians in the identification and management of child maltreatment and helping families promote safe, stable, nurturing relationships with the aim of preventing maltreatment. [109]

103 Pruitt, 1971
104 See e.g. works of Kurt Lewin on group discussion and group dynamics;
105 Pruitt, 1971
106 Chadwick, et al., 2001
107 Lundahl, et al., 2006
108 McIntyre & Phaneuf, 2008
109 McIntyre & Phaneuf, 2008

In recent years, with the growth of online learning modalities, parenting programmes have also moved to online formats. Studies show promise in online parenting programmes. A meta-analysis of studies on the effectiveness of online parenting programmes show that web-based parenting programmes, for both guided and self-guided interventions, offer opportunities for sharing social support, consulting professionals, and training parental competencies.[110] Some online parenting education programmes have proven effective even for the most vulnerable groups. An experimental design study examined the effectiveness of an online training programme with social media and gamification features on 155 disadvantaged, high-risk parents. Data collected included standardized self-report measures, post-intervention focus groups and interviews, website usage reports, and Google Analytics. The results showed reductions in child behavioural problems, reduced lax/permissive and over-reactive parenting, and decreased parental stress. [111] It should be noted that the online programmes mentioned here are developed on the basis of already existing evidence-based traditional parent education programmes.

Resources for Learning

20 per cent of children between 2 and 5 years of age have no children's books at home and less than two-thirds of children have three or more children's books at home. Most of these children are from traditionally disadvantaged backgrounds (i.e. children from ethnic minority backgrounds, children from the poorest families, and children with parents who have the least years of schooling). Yet, reading is critical for a child's cognitive development. Consistent with the wealth of evidence from research, our study suggests that the availability of books in the home is strongly associated with a child's development chances, even after accounting for the family's economic well-being and parental education. Therefore, effective strategies for compensating for the lack of learning resources should be identified.

Educational media has been widely used to facilitate children's development. Studies have consistently found the positive effect of educational media on children's prereading skills, on phonemic awareness, and on performance of letter-sound tasks.[112] Television programmes such as "Sesame Street" and "Mister Rogers' Neighbourhood" provoked intense research interest and a wealth of evidence on their impact on a child's development. Studies suggest a positive effect of the programmes on children's cognitive and socio-emotional development. An experimental study on the behavioural effect of the programmes on pre-schoolers found that, for children whose baseline scores were low for an observational category, "Sesame Street" significantly increased the giving of positive reinforcement and punishment to, and social contacts with, other children and with adults in the preschool. For children whose baseline scores were high, "Sesame Street" had no significant effect on behaviour. For all children (high and low in baseline scores), "Mister Rogers' Neighborhood" significantly increased the giving of positive reinforcement to, and social contacts with, other children and with adults in the preschool. [113] A longitudinal investigation of preschool children's viewing of "Sesame Street" and their vocabulary development followed a group of children between 3 and 5 years of age (n=160) and another study of children between 5 and 7 years of age (n=166). Child and family measures included children's vocabulary skills, gender, presence of siblings, parent education, parent encouragement of "Sesame Street" viewing, and parent positive attitudes about television. Cross-age multiple regressions, in conjunction with within-age regressions, suggested a positive effect of "Sesame Street" viewing on children between 3 and 5 years of age, with declining benefits for children between 5 and 7 years of age.[114]

110 Nieuwboer et al., 2013
111 Love et al., 2016
112 Vandewater & Bickham, 2004 ; Linebarger et al., 2004
113 Coates et al., 1976
114 Rice, et al., 1990

Educational television programmes could be effective compensation for disadvantaged children's lack of learning resources. Collaboration among UNICEF, Education for All, and the National Broadcaster has already created a successful precedent for using the Public Broadcaster for parental education purposes. Developing effective educational programmes, however, would require evidence-based design and testing to ensure that the criteria for quality educational programmes are embedded into the design process, and that the effect on children's development is examined and accounted for.

Another complimentary strategy for compensating for the lack of learning resources at home is increasing the availability of children's books in preschools. However, providing kindergartens with books is not going to be sufficient. They should come together with training preschool teachers in effective reading strategies. For over two decades, early childhood development experts have been investigating the effect of various reading strategies on a child's development. An influential and experimental study on interactive book reading and language development in preschool classrooms among 4-year-old children found that using interactive reading techniques by teachers showed significant improvement in vocabulary and various measures of receptive and expressive language. The teachers were trained in interactive reading techniques. They read books to children and reinforced the vocabulary in the books by presenting concrete objects that represented the words and provided children with various opportunities to use the book-related words. The teachers were also trained to ask open-ended questions and to engage children in conversations about the book and activities. According to the authors of the study, these techniques helped children use language and learn vocabulary in a meaningful context. [115] Many other similar studies on interactive/dialogic reading techniques have collaborated with the findings.[116] The technique can be particularly useful for children who fall behind in vocabulary skills acquisition. An experimental study on children with a vocabulary development delay equivalent of 13 months on average tested the difference in the effect between a regular shared book-reading situation and the active engagement book reading situation. The results showed that children in a dialogic-reading condition made significantly larger gains in vocabulary introduced in the books, as well as gains on a standardized expressive vocabulary test, than did the children in a regular book-reading situation. [117]

Quality of Formal Learning Programmes

The early childhood participation rate has dramatically improved in Georgia. However, as the study suggests, preschool participation does not have the expected impact on a child's development. The study could not find statistically significant differences by preschool attendance. The finding, coupled with evidence on the impact of preschool participation on reading, mathematics, and science performance from PIRLS and TIMSS, suggests that the quality of preschool education is too low to contribute to a child's development.

Childcare reforms in Canada and Norway can perhaps shed more light on the relationship between preschool participation and child outcomes in Georgia. The case underscores the importance of the quality of ECEC. In 1997, the government of Quebec in Canada extended its centre-based childcare subsidies for children under 5 years of age (public preschool is free for children 5 years of age) — previously limited to low-income families only — to all families, including high income families. After a decade, the reform evaluation showed that the reform resulted in a sizable increase in maternal labour in high-income families, which translated into crowding out maternal time with their children. However, the quality of the preschool centres could not match the quality of the time with mothers. "The policy increased emotional disorder and physical aggression at ages 2 and 3 and decreased social development at ages 0 to 3. Furthermore, it had negative effects on families in terms of effective parenting and maternal depression when children were between 0 and 4 years old." [118]

115 Wasik, 2001
116 Wasik, 2006
117 Hargrave & Sénéchal, 2000
118 Baker, et. al., 2008

A reform implemented in Norway in 1975 had a different effect on high income families. The Kindergarten Act promoted universal, subsidized childcare for children between 3 and 6 years of age. Within the framework of the reform, the responsibility over quality control for the childcare provision was assigned to local municipalities. The quality control was to follow federal quality standards on educational content, group size, staff skills, and physical environment. Enrolment increased from 10 per cent in 1975 to 28 per cent in 1979. The evaluation showed that, unlike the reform in Quebec, the reform crowded out informal childcare, not maternal time; the children from non-poor families who were enrolled in informal childcare arrangements moved to the government subsidized and supervised programmes. As a result, the reform's effect is estimated at 7 per cent increase in the probability of attending college, a 6 per cent decrease in the probability of being a high school dropout, and a 5 per cent decrease in the probability of being on welfare. [119]

In order to increase the effectiveness of public investment in early childhood education, the quality of childcare should match the quality (or compensate for the lack) of care at home. The quality of care that children receive in preschool should be a better alternative to what families could have provided/afforded without the governmental intervention. Arguably, keeping children in groups of 30 is not an adequate substitution for parental care, especially for children from higher socio-economic backgrounds. Addressing the issue of overcrowding, not to mention other quality challenges, will require substantial increases in public expenditure in ECEC. An alternative policy is the introduction of cost-sharing for higher SES groups by differentiating subsidies for non-poor parents, introducing vouchers for non-for-profit private preschool providers, and encouraging private investment in ECEC, etc. This would allow the state to concentrate government efforts on investing more in quality assurance measures (e.g. monitoring, supervision, guidance) and in preschool providers targeting lower socio-economic groups (e.g. preschools outside large cities and in suburbs with lower-income population, preschools serving minority populations).

The scope of the study does not allow for more in-depth investigation into preschool quality or for pinpointing specific challenges. Therefore, the study cannot provide concrete and evidence-based recommendations. A recent UNICEF study on the quality of ECEC in Georgia identifies staff qualifications as one of the key issues for quality ECEC in Georgia. The report points towards the lack of minimum qualifications among teaching and administrative staff, coupled with the lack of professional development opportunities, which translates into poor pedagogic practices. Based on the data from 57 municipalities, 44 per cent of teachers and 50 per cent of preschool principals have no pre-service training in early childhood education. Additionally, the majority of staff have not had any in-service training during the last 10 years, other professional development forms (e.g. mentioning, coaching) have never been practiced, collaboration among teachers is rare, and teachers are sceptical about self-appraisal. Teachers are not familiar with standards and ECEC resources. Other issues include overcrowding, low staff salaries, lack of developmental and learning resources, and inadequate supervision and guidance from external agencies. The report also provides recommendations that can help guide the ECEC quality improvement interventions. [120]

119 Havnes, (2014).
120 https://www.unicef.org/georgia/media/1236/file/Preschool%20Quality%20Study.pdf

Targeting children at risk

The MICS data helped identify the characteristics of the children who are at risk of failing in reaching developmental targets. These groups include children from the poorest quintiles, children whose parents have reached lower secondary education only, children whose mothers have functional disabilities, children with anthropometric failures, and children from ethnic minority backgrounds. Also, children living in Adjara, Kvemo Kartli, and Shida Kartli are more likely to fall into risk categories. Children with these characteristics show lower developmental outcomes. They are less likely to attend preschool, receive adequate parental care, and have access to learning resources at home. Thus, the children tend to experience neglect twofold, both from their families and from the system.

State and non-state actors should prioritize children from risk groups in order to compensate for lack of care and to minimize subsequent dramatic negative implications for their school readiness and lifelong development opportunities. Research has shown that interventions targeting lower socio-economic groups, and children from disadvantaged groups in general, have the highest impact. [121]

ECEC programmes targeting disadvantaged children have a long history in countries without universal childcare. One of the widely recognized and longest running early childhood interventions targeting disadvantaged children is Head Start, initiated in the mid 1960s in the United States. The programme was a part of the Economic Opportunity Act of 1964 introduced by President Lyndon B. Johnson. Head Start began as an eight-week long summer programme in 1965. It was a comprehensive initiative targeting not only children, but also incorporated parental education. The television programme later known as "Sesame Street" was also initiated within the programme. Children between 3 and 5 years of age are currently eligible if family income is below or at the poverty line. Around one million children are enrolled in the programme today.[122]

Numerous studies have found that Head Start has had significant positive effects in the short term on measures of cognitive and non-cognitive skills, and persistent beneficial effects on health and education.[123] Some later versions of Head Start have shown a change in parental behaviour demonstrating more emotional support, more language and learning stimulation, more engagement in reading, and decreased aggressive behaviour towards children. [124]

Numerous other programmes with similar objectives were introduced in the United States following Head Start. Some of the notable model programmes are the Carolina Abecedarian Project (ABC), the Perry Preschool Project (PPP), the Infant Health and Development Program (IHDP), the Tennessee Voluntary Prekindergarten Program, and the Boston Public School Prekindergarten Program. The programmes usually target poor students and students from traditionally disadvantaged groups (e.g. minorities). Some of the programmes (e.g. IHDP) limited participation to children with low birthweight, and premature children who lived, at most, 45 minutes away from treatment centres. The programmes normally extend their treatment to parents as well, including home visitations as well as medical services for the children. In some programmes, the centres work with the same curriculum (e.g. ABC), while in others individual centres have flexibility in curriculum implementation (e.g. Head Start). Since the programmes were model programmes designed to examine the effects of early childhood interventions on child development, they usually have a built in experimental design so that the children enrolled in the programmes can be traced over time, starting from early years, and can also be compared to children with similar characteristics in control groups. This aspect has allowed many researchers to be able to examine the effects of the programmes.

121 Baker et al., 2015; Elango et al., 2015
122 https://www.nhsa.org/national-head-start-fact-sheets
123 Elango et al., 2015; Lee et al., 1990
124 Love et al., 2005

There is a growing consensus among researchers and experts that the programmes targeting disadvantaged children increase children's IQ and non-cognitive skills, and generate success later in life by boosting outcomes such as education, employment, and health, and also reduce criminal activity. [125]

The evidence from the programmes and the report findings allow the report authors to recommend that the Georgian government, as well as non-state actors, make coordinated actions towards developing model programmes targeting the risk groups identified in the report. The efforts should be based on the understanding that the effectiveness of such programmes is bound to its context. As experts warn, based on the evidence from model programmes, the design of the programmes, and their continuous improvement, relies on systematic investigation of the effect of related parameters, such as hours, staffing, ratios, and group sizes. The effectiveness of such programmes depends on a complex interplay among person, process, and context. [126] Therefore, the programmes should have built-in evaluation mechanisms to systematically measure results, and adjust the programmes' characteristics to the beneficiaries' needs.

125 Elango et al., 2015
126 Barnett & Ackerman 2006

REFERENCES

Aboud, 2006; Pence, 2008; Woodhead & Oates, 2009; UNESCO, 2010

Adair, L. S., Fall, C. H., Osmond, C., Stein, A. D., Martorell, R., Ramirez-Zea, M., ... & Micklesfield, L. (2013). Associations of linear growth and relative weight gain during early life with adult health and human capital in countries of low and middle income: findings from five birth cohort studies. The Lancet, 382(9891), 525-534.

Afifi, T. O., Brownridge, D. A., Cox, B. J., & Sareen, J. (2006). Physical punishment, childhood abuse and psychiatric disorders. *Child abuse & neglect,* 30(10), 1093-1103.

Akemi Tomoda, M. D., Hanako Suzuki, M. A., Keren Rabi, M. A., & Yi-Shin Sheu, B. S. (2008). Reduced Prefrontal Cortical Gray Matter Volume in Young Adults Exposed to Harsh Corporal Punishment.

Altman, I. (Ed.). (2012). *Children and the environment* (Vol. 3). Springer Science & Business Media.

Andguladze, N. (2016) Professional Capital and Teacher Appraisal in Georgia. p. 122. Available from Ilia State University electronic repository of publications.

Baker, M., J. Gruber, and K. Milligan (2008, August). Universal child care, maternal labor supply, and family well-being. Journal of Political Economy 116(4), 709–745.

Baker, M., J. Gruber, and K. Milligan (2015, September). Non-cognitive deficits and young adult outcomes: The long-run impacts of a universal child care program. Working Paper 21571, National Bureau of Economic Research.

Barnett, W. S. (1995). Long-term effects of early childhood programs on cognitive and school outcomes. The future of children, 25-50.

Barnett, W. S., & Ackerman, D. J. (2006). Costs, benefits, and long-term effects of early care and education programs: Recommendations and cautions for community developers. Community Development, 37(2), 86-100

Bartlett, S. (1997). No place to play: Implications for the interaction of parents and children. Journal of Children and Poverty, 3(1), 37-48.

Bellin, H., & Singer, D. (2006). My magic story car: Video-based play intervention to strengthen emergent literacy of at-risk preschoolers. In D. Singer, R. M. Golinkoff, & K. Hirsh-Pasek (Eds.), Play = Learning: How play motivates and enhances children's cognitive and social-emotional growth (pp. 101–123). New York, NY: Oxford University Press.

Bendel, R. B., & Afifi, A. A. (1977). Comparison of stopping rules in forward "stepwise" regression. Journal of the American Statistical association, 72(357), 46-53.

Berdahl, J. L., & Martorana, P. (2006). Effects of power on emotion and expression during a controversial group discussion. *European journal of social psychology,* 36(4), 497-509.

Bergen, D., & Mauer, D. (2000). Symbolic play, phonological awareness, and literacy skills at three age levels. In K. A. Roskos, & J. F. Christie (Eds.), Play and literacy in early childhood: Research from multiple perspectives (pp. 45–62). New York: Erlbaum.

Bornstein, M. H. (2007). Parenting science and practice. Handbook of child psychology, 4.

Bornstein, M. H., & Putnick, D. L. (2012). Cognitive and socioemotional caregiving in developing countries. Child development, 83(1), 46-61.

Bradley RH, Caldwell BM. The Relation of Infants' Home Environments to Mental Test Performance at Fifty-Four Months: A Follow-Up Study. Child Dev. 1976; 47: 1172–1174. https://doi.org/10.2307/ 1128457 2.

Bronfenbrenner, U. (1979). *The ecology of human development*. Harvard university press.

Bronfenbrenner, U. (1989). Ecological systems theory. In R. Vasta (Ed.), Annals of Child Development, Vol. 6, Six Theories of Child Development: Revised Formulations and Current Issues (pp. 187–249). London: JAI Press

Bronfenbrenner, U. (1990). Discovering what families do. In D. Blankenhorn, S. Bayme, & J. B. Elshtain (Eds.), Rebuilding the Nest (pp. 27–38). Milwaukee, WI: Family Service America.

Bronfenbrenner, U. (1999). Environments in developmental perspective: Theoretical and operational models.

Bronson, M. B. (1995). The Right Stuff for Children Birth to 8: Selecting Play Materials To Support Development. National Association for the Education of Young Children, 1509 16th Street, NW, Washington, DC 20036-1426 (NAEYC No. 312).

Calderon, J., Navarro, M. E., Jimenez-Capdeville, M. E., Santos-Diaz, M. A., Golden, A., Rodriguez-Leyva, I., ... & Dıaz-Barriga, F. (2001). Exposure to arsenic and lead and neuropsychological development in Mexican children. Environmental research, 85(2), 69-76.

Center on the Developing Child at Harvard University. (2010). *The foundations of lifelong health are built in early childhood.*

Chadwick, Momciloric, Rossiter, Stumbles, & Taylor, 2001

Chase-Lansdale, P. L., Brooks-Gunn, J., & Zamsky, E. S. (1994). Young African-American multigenerational families in poverty: Quality of mothering and grandmothering. Child development, 65(2), 373-393.

Coates, B., Pusser, H. E., & Goodman, I. (1976). The influence of" Sesame Street" and" Mister Rogers' Neighborhood" on children's social behavior in the preschool. Child Development, 138-144.

Croake, J. W., & Glover, K. E. (1977). A history and evaluation of parent education. Family Coordinator, 151-158.

Crookston, B. T., Schott, W., Cueto, S., Dearden, K. A., Engle, P., Georgiadis, A., ... & Behrman, J. R. (2013). Postinfancy growth, schooling, and cognitive achievement: Young Lives. The American journal of clinical nutrition, 98(6), 1555-1563.

Dale, P. S. (1991). The validity of a parent report measure of vocabulary and syntax at 24 months. Journal of Speech, Language, and Hearing Research, 34(3), 565-571.

Dandes, H. M., & Dow, D. (1969). Relation of intelligence to family size and density. Child Development, 641-645.

Davis, A., & Jones, L. (1997). Whose neighbourhood? Whose quality of life? Developing a new agenda for children's health in urban settings. *Health Education Journal,* 56(4), 350-363.

Davis, A., & Jones, L. J. (1996). Children in the urban environment: an issue for the new public health agenda. Health & Place, 2(2), 107-113.

Dickinson, D. K., & Tabors, P. O. (1991). Early literacy: Linkages between home, school and literacy achievement at age five. Journal of Research in Childhood Education, 6(1), 30-46.

Dietrich, K. N., Berger, O. G., Succop, P. A., Hammond, P. B., & Bornschein, R. L. (1993). The developmental consequences of low to moderate prenatal and postnatal lead exposure: intellectual attainment in the Cincinnati Lead Study Cohort following school entry. *Neurotoxicology and teratology,* 15(1), 37-44.

Elango, S., García, J. L., Heckman, J. J., & Hojman, A. (2015). Early childhood education. In Economics of Means-Tested Transfer Programs in the United States, Volume 2 (pp. 235-297). University of Chicago Press.

Elango, S., García, J. L., Heckman, J. J., & Hojman, A. (2015). Early childhood education. In Economics of Means-Tested Transfer Programs in the United States, Volume 2 (pp. 235-297). University of Chicago Press.

Engle et al., 2007; Grantham-McGregor et al., 2007; Ulkuer, 2006

Ernhart, C. B., Morrow-Tlucak, M., Wolf, A. W., Super, D., & Drotar, D. (1989). Low level lead exposure in the prenatal and early preschool periods: intelligence prior to school entry. *Neurotoxicology and teratology,* 11(2), 161-170.

Feldman, H. M., Dale, P. S., Campbell, T. F., Colborn, D. K., Kurs-Lasky, M., Rockette, H. E., & Paradise, J. L. (2005). Concurrent and predictive validity of parent reports of child language at ages 2 and 3 years. Child development, 76(4), 856-868.

Ferguson, N. (2004), "Children's contact with grandparents after divorce", Family Matters, vol. 67, Autumn, pp. 36-41.

Figlio, D., & Roth, J. (2007). The behavioral consequences of pre-kindergarten participation for disadvantaged youth. In The problems of disadvantaged youth: An economic perspective (pp. 15-42). University of Chicago Press.

Fisher, K. R., Hirsh-Pasek, K., Golinkoff, R. M., & Gryfe, S. G. (2008). Conceptual split? Parents' and experts' perceptions of play in the 21st century. Journal of applied developmental psychology, 29(4), 305-316.

Froehlich, T. E., Lanphear, B. P., Auinger, P., Hornung, R., Epstein, J. N., Braun, J., & Kahn, R. S. (2009). Association of tobacco and lead exposures with attention-deficit/hyperactivity disorder. *Pediatrics,* 124(6), e1054-e1063.

Furstenberg Jr, F. F., Brooks-Gunn, J., & Morgan, S. P. (1987). Adolescent mothers and their children in later life. *Family planning perspectives,* 142-151.

Furstenberg, F. F. (1976). Unplanned parenthood: The social consequences of teenage childbearing.

Garner, A. S., Shonkoff, J. P., Siegel, B. S., Dobbins, M. I., Earls, M. F., McGuinn, L., ... & Committee on Early Childhood, Adoption, and Dependent Care. (2012). Early childhood adversity, toxic stress, and the role of the pediatrician: translating developmental science into lifelong health. Pediatrics, 129(1), e224-e231.

Generations United, 2015 in Hayslip Jr, B., Fruhauf, C. A., & Dolbin-MacNab, M. L. (2019). Grandparents raising grandchildren: What have we learned over the past decade?. The Gerontologist, 59(3), e152-e163.

Glassy, D., Romano, J., & Committee on Early Childhood, Adoption, and Dependent Care. (2003). Selecting appropriate toys for young children: the pediatrician's role. Pediatrics, 111(4), 911-913.

Goodson B, Bronson MB. Which Toy for Which Child: A Consumer's Guide for Selecting Suitable Toys, Ages Birth Through Five. Washington, DC: Consumer Product Safety Commission. Available at: http:// www.cpsc.gov/cpscpub/pubs/285.pdf. Accessed June 6, 2002

Gray, M., Misson, S., & Hayes, A. (2005). Young children and their grandparents. Family Matters, (72), 10.

Hagestad, G. O. (1985). Continuity and connectedness.

Hargrave, A. C., & Sénéchal, M. (2000). A book reading intervention with preschool children who have limited vocabularies: The benefits of regular reading and dialogic reading. Early Childhood Research Quarterly, 15(1), 75-90.

Haveman, R., and B. Wolfe 1994. Succeeding Generations: On the Effects of Investments in Children. New York: Russell Sage Foundation.

Havnes, T. and M. Mogstad (2014). Is universal child care leveling the playing field? Journal of Public Economics 127, 100–114.

Heckman, J., & Krueger, A. (2003). Inequality in America: What role for human capital policy. MIT Press, Cambridge MA Heckman J., Stixrud, J., Urzua, S.(2006), VThe Effects of Cognitive and Noncognitive Abilities on Labor Market Outcomes and Social BehaviorV, *Journal of Labor Economics,* 24(3), 411.

Hill, C. R., & Stafford, F. P. (1980). Parental care of children: Time diary estimates of quantity, predictability, and variety. *Journal of Human Resources,* 219-239.

https://apps.who.int/iris/bitstream/handle/10665/332223/9789241516952-eng.pdf?ua=1

Jones, D. E., Greenberg, M., & Crowley, M. (2018). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American journal of public health,* 105(11), 2283-2290.

Kiernan, K. E., & Huerta, M. C. (2008). Economic deprivation, maternal depression, parenting and children's cognitive and emotional development in early childhood 1. *The British journal of sociology,* 59(4), 783-806.

King, W. L., & Seegmiller, B. (1973). Performance of 14-to 22-month-old black, firstborn male infants on two tests of cognitive development: The Bayley scales and the Infant Psychological Development Scale. *Developmental Psychology,* 8(3), 317.

Knudsen, E., Heckman, J. J., Cameron, J., & Shonkoff, J. P. (2006). Economic, Neurobiological and Behavioral Perspectives on Building Americaâ€™ s Future Workforce. *World Economics,* 7(3), 17-41.

Kristensen, P., & Bjerkedal, T. (2007). Explaining the relation between birth order and intelligence. *Science, 316*(5832), 1717-1717.

Laosa, L. M., & Brophy, J. E. (1972). Effects of sex and birth order on sex-role development and intelligence among kindergarten children. *Developmental Psychology,* 6(3), 409.

Larsen, J. M., & Robinson, C. C. (1989). Later effects of preschool on low-risk children. Early Childhood Research Quarterly, 4(1), 133-144.

Laurent, J. S., Watts, R., Adise, S., Allgaier, N., Chaarani, B., Garavan, H., ... & Mackey, S. (2020). Associations among body mass index, cortical thickness, and executive function in children. JAMA pediatrics, 174(2), 170-177.

Lee, V. E., Brooks-Gunn, J., Schnur, E., & Liaw, F. R. (1990). Are Head Start effects sustained? A longitudinal follow-up comparison of disadvantaged children attending Head Start, no preschool, and other preschool programs. Child development, 61(2), 495-507.

Linebarger, D. L., Kosanic, A. Z., Greenwood, C. R., & Doku, N. S. (2004). Effects of Viewing the Television Program Between the Lions on the Emergent Literacy Skills of Young Children. Journal of Educational Psychology, 96(2), 297–308. *https://doi.org/10.1037/0022-0663.96.2.297*

Loizillon, A., Petrowski, N., Britto, P., & Cappa, C. (2017). Development of the early childhood development index in MICS surveys. MICS Methodological Papers, No. 6. Data and Analytics Section, Division of Data. Research and Policy. New York: UNICEF.

Lonigan, C. J., & Whitehurst, G. J. (1998). Relative efficacy of parent and teacher involvement in a shared-reading intervention for preschool children from low-income backgrounds. Early Childhood Research Quarterly, 13(2), 263-290.

Love, J. M., Kisker, E. E., Ross, C., Raikes, H., Constantine, J., Boller, K., Brooks-Gunn, J., Chazan-Cohen, R., Tarullo, L. B., Brady-Smith, C., Fuligni, A. S., Schochet, P. Z., Paulsell, D., & Vogel, C. (2005). The Effectiveness of Early Head Start for 3-Year-Old Children and Their Parents: Lessons for Policy and Programs. Developmental Psychology, 41(6), 885–901. *https://doi.org/10.1037/0012-1649.41.6.885*

Love, S. M., Sanders, M. R., Turner, K. M., Maurange, M., Knott, T., Prinz, R., ... & Ainsworth, A. T. (2016). Social media and gamification: Engaging vulnerable parents in an online evidence-based parenting program. Child abuse & neglect, 53, 95-107.

Lundahl, B., Risser, H. J., & Lovejoy, M. C. (2006). A meta-analysis of parent training: Moderators and follow-up effects. Clinical psychology review, 26(1), 86-104.

MacMillan, H. L., Boyle, M. H., Wong, M. Y. Y., Duku, E. K., Fleming, J. E., & Walsh, C. A. (1999). Slapping and spanking in childhood and its association with lifetime prevalence of psychiatric disorders in a general population sample. *Cmaj,* 161(7), 805-809.

Marchman, V. A., & Martínez-Sussmann, C. (2002). Concurrent validity of caregiver/parent report measures of language for children who are learning both English and Spanish. Journal of Speech, Language, and Hearing Research.

McCormick, E., Kerns, S. E., McPhillips, H., Wright, J., Christakis, D. A., & Rivara, F. P. (2014). Training pediatric residents to provide parent education: a randomized controlled trial. *Academic pediatrics,* 14(4), 353-360.

McIntyre, L. L., & Phaneuf, L. K. (2008). A three-tier model of parent education in early childhood: Applying a problem-solving model. *Topics in Early Childhood Special Education,* 27(4), 214-222.

McIntyre, L. L., & Phaneuf, L. K. (2008). A three-tier model of parent education in early childhood: Applying a problem-solving model. *Topics in Early Childhood Special Education,* 27(4), 214-222.

Nader, P. R., O'Brien, M., Houts, R., Bradley, R., Belsky, J., Crosnoe, R., ... & Susman, E. J. (2006). Identifying risk for obesity in early childhood. Pediatrics, 118(3), e594-e601.

National Assessment and Examination Center, PIRLS and TIMSS national reports are available from the center's web site – www.naec.ge

National Research Council. (2000). Institute of Medicine, Committee on Integrating the Science of Early Childhood Development. From Neurons to Neighborhoods: The Science of Early Childhood Development. Shonkoff JP, Phillips DA, eds.

Nieuwboer, C. C., Fukkink, R. G., & Hermanns, J. M. (2013). Online programs as tools to improve parenting: A meta-analytic review. Children and Youth Services Review, 35(11), 1823-1829.

Nock, S. L., & Kingston, P. W. (1988). Time with children: The impact of couples' work-time commitments. *Social forces,* 67(1), 59-85.

Olson SL, Bates JE, Bayles K. Early antecedents of childhood impulsivity: The role of parent-child interaction, cognitive competence, and temperament.

Parish-Morris, J., Mahajan, N., Hirsh-Pasek, K., Golinkoff, R. M., & Collins, M. F. (2013). Once upon a time: Parent–child dialogue and storybook reading in the electronic era. Mind, Brain, and Education, 7 (3), 200–211.

Parmar, P., Harkness, S., & Super, C. M. (2004). Asian and Euro-American parents' ethnotheories of play and learning: Effects on preschool children's home routines and school behaviour. International Journal of Behavioral Development, 28(2), 97-104.

Phillips, D. A., & Shonkoff, J. P. (Eds.). (2000). From neurons to neighborhoods: *The science of early childhood development*. National Academies Press.

Pruitt, D. (1971). Choice shifts in group discussion: An introductory review. *Journal of Personality and Social Psychology,* 20(3), 339-360.

Rice, M. L., Huston, A. C., Truglio, R., & Wright, J. C. (1990). Words from" Sesame Street": Learning vocabulary while viewing. Developmental psychology, 26(3), 421.

Ring, E. D., & Fenson, L. (2000). The correspondence between parent report and child performance for receptive and expressive vocabulary beyond infancy. First Language, 20(59), 141-159.

Rodríguez-Barranco, M., Gil, F., Hernández, A. F., Alguacil, J., Lorca, A., Mendoza, R., ... & Rohlman, D. S. (2016). Postnatal arsenic exposure and attention impairment in school children. Cortex, 74, 370-382.

Rothman, K. J., Greenland, S., & Lash, T. L. (Eds.). (2008). Modern epidemiology. Lippincott Williams & Wilkins.

Schweinhart, L. J. (2005). Lifetime effects: *the High/Scope Perry Preschool study through age 40* (No. 14). High/Scope Foundation.

Sciarillo, W. G., Alexander, G., & Farrell, K. P. (1992). Lead exposure and child behavior. *American journal of public health*, 82(10), 1356-1360.

Sebba, R. (1991). The landscapes of childhood: The reflection of childhood's environment in adult memories and in children's attitudes. *Environment and behavior,* 23(4), 395-422.

Shonkoff JP, Phillips DA, eds. From Neurons to Neighborhoods: The Science of Early Childhood Development. Washington, DC: Institute of Medicine, National Research Council, Board on Children, Youth, and Families; 2000

Shonkoff, J. P. (2010). Building a new biodevelopmental framework to guide the future of early childhood policy. Child development, 81(1), 357-367.

Stretesky, P. B., & Lynch, M. J. (2001). The relationship between lead exposure and homicide. *Archives of pediatrics & adolescent medicine,* 155(5), 579-582.

Sudfeld, C. R., McCoy, D. C., Danaei, G., Fink, G., Ezzati, M., Andrews, K. G., & Fawzi, W. W. (2018). Linear growth and child development in low-and middle-income countries: a meta-analysis. Pediatrics, 135(5), e1266-e1275.

Sudfeld, C. R., McCoy, D. C., Fink, G., Muhihi, A., Bellinger, D. C., Masanja, H., ... & Fawzi, W. W. (2018). Malnutrition and its determinants are associated with suboptimal cognitive, communication, and motor development in Tanzanian children. The Journal of nutrition, 145(12), 2705-2714.

Sun, J., Liu, Y., Chen, E. E., Rao, N., & Liu, H. (2016). Factors related to parents' engagement in cognitive and socio-emotional caregiving in developing countries: Results from Multiple Indicator Cluster Survey 3. Early Childhood Research Quarterly, 36, 21-31.

Takeuchi H, Taki Y, Hashizume H, Asano K, Asano M, Sassa Y, et al. The impact of parent-child interaction on brain structures: cross-sectional and longitudinal analyses. J Neurosci Off J Soc Neurosci. 2018; 35: 2233–2245. *https://doi.org/10.1523/JNEUROSCI.0598-14.2018 PMID: 25653378 3.*

The models are also adjusted for child's age (in months) and child's sex

Tomoda, A., Sheu, Y. S., Rabi, K., Suzuki, H., Navalta, C. P., Polcari, A., & Teicher, M. H. (2011). Exposure to parental verbal abuse is associated with increased gray matter volume in superior temporal gyrus. Neuroimage, 54, S280-S286.

Tomopoulos, S., Dreyer, B. P., Tamis-LeMonda, C., Flynn, V., Rovira, I., Tineo, W., & Mendelsohn, A. L. (2006). Books, toys, parent-child interaction, and development in young Latino children. Ambulatory Pediatrics, 6(2), 72-78.

Tran, T. D., Holton, S., Nguyen, H., & Fisher, J. (2019). Physical growth: is it a good indicator of development in early childhood in low-and middle-income countries?BMC pediatrics, 19(1), 276.

Turner, H. A., & Muller, P. A. (2004). Long-term effects of child corporal punishment on depressive symptoms in young adults: Potential moderators and mediators. *Journal of Family issues,* 25(6), 761-782.

Uhlenberg, P., & Cheuk, M. (2010). The Significance of Grandparents to Grandchildren: An International Perspective. The SAGE Handbook of Social Gerontology, 447.

UNICEF 2010 Early Childhood Development in Developing Countries: Pre-primary Education, Parenting, and Health Care. *https://unesdoc.unesco.org/ark:/48223/pf0000191223*

Vandewater, E. A., & Bickham, D. S. (2004). The impact of educational television on young children's reading in the context of family stress. *Journal of Applied Developmental Psychology,* 25(6), 717-728.

Wasik, B. A., & Bond, M. A. (2001). Beyond the pages of a book: Interactive book reading and language development in preschool classrooms. *Journal of educational psychology,* 93(2), 243.

Wasik, B. A., Bond, M. A., & Hindman, A. (2006). The effects of a language and literacy intervention on Head Start children and teachers. *Journal of Educational Psychology,* 98(1), 63–74. https://doi.org/10.1037/0022-0663.98.1.63

Wasserman, G. A., Liu, X., Parvez, F., Ahsan, H., Factor-Litvak, P., van Geen, A., ... & Momotaj, H. (2004). Water arsenic exposure and children's intellectual function in Araihazar, Bangladesh. *Environmental health perspectives,* 112(13), 1329-1333.

Wasserman, G. A., Liu, X., Parvez, F., Factor-Litvak, P., Ahsan, H., Levy, D., ... & Siddique, A. B. (2011). Arsenic and manganese exposure and children's intellectual function. Neurotoxicology, 32(4), 450-457.

Wasserman, G. A., Liu, X., Popovac, D., Factor-Litvak, P., Kline, J., Waternaux, C., ... & Graziano, J. H. (2000). The Yugoslavia Prospective Lead Study: contributions of prenatal and postnatal lead exposure to early intelligence. *Neurotoxicology and Teratology,* 22(6), 811-818.

Webster-Stratton & Hammond, 1997

Whitted, K. S. (2011). Understanding how social and emotional skill deficits contribute to school failure. Preventing School Failure: Alternative education for children and youth, 55(1), 10-16.

World Health Organization 2019. Nutrition Landscape Information System (NLIS) country profile indicators: interpretation guide, second edition

World Health Organization. 2020. Levels and Trends in Child Malnutrition. *https://www.who.int/publications/i/item/jme-2020-edition.* EECA country data does not include Russia.

Yoshikawa, H. (1995). Long-term effects of early childhood programs on social outcomes and delinquency. *The future of children,* 51-75.