UNICEF Working Papers

Investing in Early Childhood Education in Serbia

Belgrade
September, 2012

unite for children

unicef

Investing in Early Childhood Education in Serbia

Costing models for ensuring preschool education for all

Belgrade
September, 2012

ACKNOWLEDGEMENTS

This report was commissioned by the UNICEF Country Office for Serbia.

The principal authors of this report are Sunčica Vujić, Department of Economics, University of Bath; Hana Baronijan, IPSOS Strategic Marketing; and Aleksandar Baucal, Department of Psychology, University of Belgrade.

The research methodology was guided by Jan van Ravens, International Consultant at the Faculty of the Edward Zigler Centre in Child Development and Social Policy at Yale University.

Aleksandra Jović (UNICEF Serbia) had overall responsibility for the planning, design, development and quality assurance of this initiative.

We would like to thank all those who contributed their expertise to this initiative at different stages of process. These inputs were highly appreciated and critically important.

In particular, thanks goes to: Michel Crepon, Project Coordinator, Team for Improving Preschool Education in Serbia (IMPRES); Paun Čukavac, Consultant–Analyst, Republic of Serbia Statistics Office; Jelena Jakić, Researcher at IPSOS Strategic Marketing; Mr Predrag Lažetić, Director of the Centre for Education Policy; Svetlana Marojević, former Education Specialist, UNICEF Serbia; Lidija Miškeljin, Key Expert for Early Childhood Education, IMPRES; Želimir Popov, Assistant Minister, Ministry of Education and Science; Tanja Ranković, Education Specialist, UNICEF Serbia and Lesley Miller, Deputy Representative, UNICEF Serbia.

This initiative and report would not have been possible without the support of the European Commission. Additional support was provided through the individual contribution of Novak Djoković, UNICEF Ambassador for Serbia.

This project is funded by the European Union

The contents of this publication are the responsibility of contributors
and do not reflect the views of the European Union or UNICEF.

CONTENTS

EXECUTIVE SUMMARY 6

List of Abbreviations 13

List of Tables 14

List of Figures 16

INTRODUCTION 17

The Crucial Role of Preschool Education for Children from Marginalized Groups 17
Methodological Remarks and Structure of the Report 20

1. STRATEGIC AND LEGISLATIVE FRAMEWORK FOR PRESCHOOL EDUCATION IN SERBIA 22
   - 1.1 National Strategy Documents 22
   - 1.2 Legal and Normative Framework 22
   - 1.3 Characteristics of Preschool Education in Serbia 23
   - 1.4 Comparison with the EU Countries 24
   - 1.5 Chapter Summary 25

2. CURRENT SITUATION IN PRESCHOOL EDUCATION IN SERBIA 26
   - 2.1 Preschool Education Coverage in 2010/2011 26
   - 2.1 Preschool Education Coverage Prior to 2010/2011 27
   - 2.2 Regional Differences in Enrolment and Average Number of Children per Group 31
   - 2.3 Preschool Education Coverage of Children from Marginalized Groups 33
   - 2.4 Comparison with the EU Countries 36
   - 2.5 Chapter Summary 38

3. THE REASONS FOR LOW COVERAGE OF CHILDREN IN PRESCHOOL EDUCATION IN SERBIA 39
   - 3.1 Available Physical Resource Capacities in Preschool Education 39
   - 3.2 Available Human Resource Capacities in Preschool Education 42
   - 3.3 Reasons for Preschool Non-Attendance According to the MICS4 Survey 43
   - 3.4 Comparison with the EU Countries 44
   - 3.5 Chapter Summary 45

4. CURRENT LEVELS OF PUBLIC EXPENDITURES FOR PE AND UNIT COSTS 46
   - 4.1 Current Levels of Public Expenditures 46
   - 4.2 The Unit Costs of the Current Preschool Education Programmes 47
   - 4.3 Chapter Summary 52

5. COSTS OF FULL COVERAGE OF CHILDREN 3–5.5 YEARS WITH DIFFERENT PRESCHOOL EDUCATION PROGRAMMES 53
5.1 From Unit Costs to Total Costs of Universal Preschool Education 53
5.2 Costs of Universal Free-of-Charge Three-Hour PE Programmes 55
5.3 Chapter Summary 58

6. FINANCING OF PRESCHOOL EDUCATION — POSSIBLE SCENARIOS FOR FUNDING OF THE EXTENDED COVERAGE 59
6.1 Gains from Forecasted GDP Growth 59
6.2 Level of Development-Tested User Fees 61
6.3 Efficiency Gains in Existing KGs 63
6.4 Raising the Fees for Full Day-Care Programmes in KGs 64
6.4 Cost-Sharing Scenarios 65
6.5 What is Left to pay for the Government? 67
6.6 Chapter Summary 68

7. START-UP INVESTMENTS FOR ADDITIONAL PHYSICAL AND HUMAN RESOURCE CAPACITIES 69
7.1 Declining Demographic Trends 69
7.2 Alternatives in Order to Provide Additional Physical Capacities for Preschool Education 71
7.3 Chapter Summary 73

8. CONCLUSIONS AND RECOMMENDATIONS 75

LITERATURE 78

APPENDIX 81

STRATEGIC AND LEGISLATIVE FRAMEWORK FOR PRESCHOOL EDUCATION IN SERBIA 81

A.1 The Law on the Fundamentals of the Education System 81
A.2 The Law on Preschool Education 81
A.3 Other Policy Measures which Promoted Preschool Participation 83
A.4 The Law on Regional Development 83

PRESCHOOL EDUCATION AND DEMOGRAPHIC STATISTICS IN SERBIA 85

A.5 Information on Preschool Attendance from the DD20 RSO 85
A.6 Demographic Numbers on Preschool Children from the RSO (Census Data) 88
A.7 Information on Preschool Expenditures from the Treasury 89

A.8 Sampling, Appending and Merging Data across Different Sources 92
A.9 Preschool Education Statistics — Some Issues 94

SUMMARY STATISTICS BASED ON THE SURVEYED MUNICIPALITIES 96

TABLES WITH ADDITIONAL RESULTS 101

EXECUTIVE SUMMARY

For almost a decade now, preschool education in Serbia is recognized as an important factor necessary for solving the problem of poverty and social exclusion. The National Millennium Development Goals (NMDG, 2006) specify that until 2015, 70% of children from 3 to 7 should be in preschool education, with a special focus on children from marginalized groups. The NMDG (2006) also plans to double the number of preschool institutions, with uniform geographical distribution. Further, Draft National Strategy of Education Development in Serbia until 2020 (preschool education is part of it) implies that until 2020, 75% of children from 3 to 5.5 years should be in preschool education. Currently, coverage with preschool education of children from 3 to 5.5 years is very low, especially for children from vulnerable groups and call for action.

The importance of investing in young children is well documented in the literature in psychology and economics. "Recent studies of early childhood investments have shown remarkable success and indicate that interventions in the early years are important for promoting learning and can be enriched through external channels. Early childhood interventions of high quality have lasting effects on learning and motivation. (….) Learning is a dynamic process and is most effective when it begins at a young age and continues through to adulthood," (Heckman, 2000). Society or the individual can invest in education at different points in the individual's life: early childhood, primary or secondary school, university education, on-the-job training, etc. Investments in education at different points in the life cycle may give very different rates of return or private/social benefits to education. Since much of cognitive functioning is well established by the time the child is age four or five, with the implication that the rate of return to investments in primary school is much lower, it means that investments in education at the preschool level may bring much higher long-term private and social benefits (Heckman, 2007; Heckman and Masterov, 2007).

The aim of this report is to investigate the financial feasibility and different costing scenarios in order to provide universal access to preschool education of children in Serbia in the age group between 3 and 5.5 years.

1. The analysis of the strategic and legal frameworks showed that Serbia has good policy basis that supports expansion of PE, recognising its importance. The purpose of institutional upbringing and education of preschool age children (0.5–6.5 years) has changed significantly over the last 15 years, from primarily baby-sitting and looking after children to the concept that promotes children's early development and education. This concept is also reinforced by the draft National Education Development Strategy that is pending governmental adoption. Introduction of the compulsory Preparatory Preschool Program in 2006, for children 5.5 to 6.5 years, boosted participation of children attending PE, but only for this age group. National policies are also highlighting disparity in enrolment of different vulnerable groups as an issue that needs to be addressed systematically.

2. Coverage of children with PE is generally low in Serbia, given the European benchmarks — it grows with age from 20% in crèche to 47–48% for 3 to 5.5 years old, and around 95% in compulsory PPP programmes. The coverage of children from vulnerable groups is much lower and requires special attention. Survey data reveal that preschool education covers only 29% of rural, 22% of poor and only 8% of Roma children, leaving those who need it the most not covered. Coverage is further characterised by high territorial differences that cluster municipalities into 4 groups depending

on above/below average PE enrolment rates and above/below average number of children per group. Municipalities with the highest coverage of children with PE are located in Belgrade and Vojvodina. On the other hand, two thirds of municipalities with very low coverage rates fall into a group of the most under-developed municipalities. Level of under-development of municipalities shows correlation with coverage rates across all municipalities in Serbia. Children are enrolled in three types of programmes depending on their daily duration. The majority of children attend full-day programmes as opposed to half day and 3-hour programmes. When comparing coverage by PE in Serbia in the past years to the situation in the EU countries, it is evident that enrolment of children from 3 to 5.5 years is much lower. Enrolment of 3 and 4 years old in 2005/2006 in EU 27 was 74% and 87% respectively. In Serbia, in 2010/2011, only 37% of 3 year old and 42% of 4 year old were enrolled into preschool education programmes. Although enrolment trends in Serbia show an increase, it seems that demographic changes and negative population trends play an important role in it and, if Serbia wants to reach its own targets, policy intervention must be introduced to expand the PE coverage.

3. As a next step, the reasons for low coverage of children by the preschool education in Serbia, particularly in the age group from 3 to 5.5 years were reviewed. First, available public preschool capacities, that accommodate 99% of enrolled children, are not sufficient to cover the total number of children left out from the preschool education in Serbia. The network of preschool institutions is not evenly geographically distributed with frequently preschool institutions being absent where there is the highest need (in under-developed and rural areas). New buildings were built every year, especially in municipalities in Belgrade. Those capital investments, accompanied with negative demographic trends considerably decreased percentage of children not accepted due to lack of capacity or those accepted over capacity, but their number still reaches 7%. Although, on average, Serbia has optimal number of children per PE group, number of children in age groups of 3 and 4 years exceeds norm of 20 (22) children per group and reaches 25 among 3 year-olds and 26 in groups of 4 year-old children. Lack of physical capacity is one important aspect of low coverage but there are other equally important ones. Information from the MICS4 (2011) data, where parents of children from 3 to 5 years who did not attend kindergarten were asked for reasons of non-attendance, show that 59% of parents think that there is no need to send children to PE as there is someone at home to take care of them. They primarily see PE through its custodial function and do not see other benefits of preschool attendance for development of their children at this stage. Different characteristics related to access to PE (e.g., cost of services and other associated costs, transport, etc.) present obstacle for preschool attendance for 30–44% of the poor, Roma, and children from rural areas. These findings show that expansion of PE coverage will require undivided attention on two fronts. First, increase in physical PE capacities is needed and it is encouraging that new legislation gives directions for better planning of the network of PE institutions and sets criteria for opening of new PE institutions based on child development function of PE. Second, there is a need to increase parents' awareness on benefits and importance of PE for development of their children.

4. Public expenditures for education in Serbia are below their respective means for OECD countries (4.53% of GDP and 11% of public expenditures in Serbia versus 5.4% and 12.9% in OECD countries) and would benefit from additional resources. Expenses are shared by the national and local budgets where local Governments account for almost 20% of all public expenditures on education

and they spend higher share of their total expenditures on education (14.2%) than the national Government. Expenditures for preschool education were 0.43% out of 4.53% of GDP earmarked for education, which is again lower than in OECD countries (0.5%). Relative share of PE expenditures in total education expenditures was higher in Serbia than in OECD (9.3% versus 7.9%), which can be attributed to the later start of primary education in Serbia but also shows that this money is not used efficiently enough. In order to calculate the unit cost of preschool education, data from the Treasury of the Ministry of Finance for 2007–2009, on funds spent for PE from municipal budgets, were used. Local Governments in Serbia were spending around 13.3 billion RSD or 139 million EUR annually on PE (expressed in December 2009 RSD and EUR, respectively). When increased by 20% what is the value of parents' contributions, total expenditures reached amount of 16.6 billion dinars or around 173 million EUR. The Republic Statistical Office classifies preschool programs as per their duration into 3 groups: less than 4 hours, 6–8 hours and longer than 8 hours. This information are not visible as such in budget expenditures from the Treasury. So, in order to calculate the unit cost, it is estimated that full-day programs last 9 hours, half day equals to 6 hours and the shortest programs last 3 hours. Then the stay of all children in PE was recalculated through 3-hour units. When the total expenditures were divided per total number of 3-hour units, the unit cost of the shortest program that realistically lasts 3–4 hours was obtained in the maximum value of about 500 EUR per year. The unit cost of the half-day program (6–8 hours) is about 1,000 EUR and the cost of full-day programme (more than 8 hours) is about 1,500 EUR per year.

5. With the calculated unit costs, different scenarios for expansion of preschool education coverage and their costing were developed. The costs of universal coverage of all children currently out of PE ranges from maximum 46 million EUR for 3–4 hour programmes to 137 million EUR for full-day programmes. The costs of covering all children into PE are from 87 million EUR for 3–4 hour programmes to 261 million EUR for full-day programmes. Expansion of PE and enrolment of all children that are currently out of PE can be done gradually, first by focusing on children in the age group of 4–5.5 years and in the second phase on 3 year-old children. This would split the needed funds into two phases requiring investment of 26 million EUR for 3–4 hour programmes to 79 million EUR if all are enrolled into full-day programmes in the first phase. The second phase would require from 20 million EUR for 3–4 hour programmes to 59 million EUR for full-day programmes. Taking into account considerable difference in the costs of full-day and 3–4 hour programmes and the fact that good quality 3–4 hour programmes meet development needs of children, introduction of the universal, free-of charge 3–4 hour programmes seems as an option that is feasible from the financial side and at the same time adequate from the child development perspective. Argument put forward here is that preschool education should be observed as a strategic interest of the state and not only responsibility of local Governments and this argument is a base for the proposition of cost-sharing between the local and the national budgets. Territorial differences in coverage and levels of municipal development are also used as criteria for differentiation of transfers from the national to the local level. Covering remaining children aged 3–5.5 years with the three-hour PE programmes would require 46 million EUR. Given that 63% of children live in municipalities from the first category of development and 37% live in the other three groups, PE investments for the first group amount to 23 million EUR and 22 million EUR for the municipalities in the remaining 3 groups. If PE represents strategic national interest, national budget could participate in bearing the costs for the most underdeveloped municipalities in the amount of 20% or 40%, or could also participate in sharing the costs for all municipalities in

the amount of 20%. Different scenarios require allocations from the national budget in the range from 6.4 to 13 million EUR under the first scenario and 17.4 million EUR under the second scenario, hereby decreasing the required amounts to be covered by the local governments.

6. In order to look for sources of finances that could cover costs created by expanded coverage, different scenarios were examined including financing with gains from GDP growth, through level of development-tested user fees, through efficiency gains in existing kindergartens, and through raising fees of full-day programmes. Even modest increase in GDP of 0.5% with the same share of expenditures for PE would create additional 150 million EUR for PE, whereas this number grows to 190 million with GDP growth of 3% forecasted for 2013. If, as the second option, share of PE would be raised to 0.5% to reach OECD share, it would generate 180 million EUR with 0.5% of GDP growth and 220 million EUR if GDP growth reaches 3%. With the help of additional funds generated through the cost-sharing scenarios, coming from level of development-tested user fees, efficiency gains in existing kindergartens, and increases in fees for full-day PE programmes, this would generate sufficient funds to cover all children aged 3–5.5 years with full-day PE programmes, whether currently in or out of preschool.

7. At the end additional physical capacities and human resources that are needed in order to accommodate all children 3–5.5 year-olds into PE are reviewed. Very rough calculations show that enrolment of the currently not enrolled 3–5.5 year-olds would require a total of around 4,500 PE groups of 21 children per group. If they are enrolled into 3-hour programmes that could be organized in 3 shifts (to be organized between 8 o'clock in the morning and 5 o'clock in the afternoon), around 1,500 additional spaces or classrooms would be needed: 945 in municipalities from development category 1 and 555 in the remaining municipalities from categories 2, 3, and 4. Enrolment of this number of children would also require employing a total of around 3,000 preschool teachers. With the current declining demographic trends and the more realistic gradual increase of preschool enrolment, required number of spaces and teachers is probably lower. Demographic trends clearly show decline in the number of children which will impact not only demand for ECD programs but will also free up space and resources at other levels of education. Freeing up space in primary schools could create additional available capacities for PE. The option in which the 3,639 PPP groups would be moved to primary schools would free space for more than two thirds of children 3–5.5 year-olds that are currently not enrolled into preschool. Some space is already available in kindergartens that have below average number of children per group and could accommodate additional 1,022 children. New preschool spaces could be created through construction of new preschool buildings, but space could also be looked for within existing community spaces and primary schools. It would require investment for adaptation and refurbishment, but these expenditures would be much lower than construction of new preschool buildings. Delivery of 3–4 hour programmes would require more modest investment as children do not need to sleep or eat in the preschool facility. Analysis of territorial differences in relation to the number of children per group and municipal enrolment rates give useful directions for policy interventions for different types of municipalities. If recurrent costs of preschool education are covered from sustainable sources such as Governmental budgets, funds for the start-up investment can be looked for among foreign donors, such as the EU with its various programmes, the World Bank, various bilateral donors, and national and international private companies with requests and proposals to contribute.

The main conclusion of the report is that the introduction of a universally accessible 3–4 hour preschool education programme for all children aged 3–5.5 would be a cost-effective measure to benefit the Serbian state and its citizens.

Overall Conclusions

- **Preschool education plays a very important role in children's development.**
  It enhances health, success in education, labour productivity and even the nation's prosperity and competitiveness in the long run, as shown by the research and analysis detailed in the report.

- **Preschool education is particularly beneficial for children from deprived groups.**
  Children from lower socio-economic groups yield a much higher rate of return on investment in early childhood education.

- **Currently preschool services are not used by those who need it the most.**
  Higher enrolment rates are associated with children from better off families, parents with higher education and from urban environments with significantly lower rates among the poorest, rural and Roma children.

- **The current network of preschool institutions is not adequate in terms of geographical coverage and physical capacity**
  Frequently preschool institutions are absent where there is the highest need (in under-developed and rural areas).

- **Local Governments are bearing 80% of current preschool education costs**
  As the majority of people benefitting from this expenditure are from higher socio economic groups, this brings into question principles of social justice and equitable distribution of the available resources.

- **Serbia has an adequate strategic and legal framework to further the expansion of preschool education**
  The importance of preschool education is recognized and the Government is committed to improvements.

- **Investments into preschool education have the highest return rates and present one of the most profitable investments Governments can make.**

General Recommendations

- **Current level and share of expenditures for preschool education is lower than in OECD countries and should be increased.**
  At the same time, when low coverage is taken into account, data also indicate a need for further analysis on the possibilities for increased efficiency.

- **Preschool education should be a strategic interest of the state and not only responsibility of municipalities and parents.**
  Given its importance, overall benefits to the state and high rates of return on investment, preschool education should be a responsibility of the state.

- **Policy makers should revise the responsibility of local Government to finance preschool**
  Given the current inequalities in coverage, related to levels of municipal development, there are good reasons for the central Government to intervene and support underdeveloped municipalities to reach higher preschool coverage rates. Depending on the economic situation and potential growth of GDP in the future, this support could be extended to all municipalities.

- **The further development of the network should be primarily based on the educative function of preschool education.**
  This expansion should explore making use of existing municipal premises and leveraging partnerships with donors, the private sector and other stakeholders.

- **Parents should be informed and educated on the benefits of preschool education.**
  Besides the lack of physical capacity and costs associated with attendance of preschool education, more than half of parents do not recognize value of preschool education for development of their children. This aspect must be addressed, to ensure that any investments in physical capacities will have the maximum impact on coverage.

- **Demographic trends should be further analysed.**
  The negative demographic trends have been a key driver in increased rates of preschool coverage but alone are not sufficient to increase coverage rates to the desired national targets. These trends should be further analysed to determine the extent to which further decreases in the number of children will free primary school capacities and leave space for their utilisation for preschool programmes.

Specific Recommendations

- **The introduction of a universally accessible 3–4 hour preschool education programme for all children aged 3–5.5 would be a cost-effective measure to benefit the Serbian state and its citizens.**
  Introducing the universality in access and coverage would have the highest chances of reaching the most vulnerable. The 3–4 hour programmes should be free of charge and available to all children 3–5.5 years old. Gradual introduction of this provision, first to children 4–5.5 years old and then 3 years old, would decrease pressure both on physical capacities for preschool education and additional resources needed.

- **3–4 hour programmes are the most cost-effective way to provide preschool education.**
  As there is no real benefit seen in developmental outcomes for a full day rather than a shorter programme, and as shorter day programme has significantly lower costs, 3–4 hour programmes have the most favorable cost-benefit ratio. The large proportion of children currently attending full-day programmes are doing so for custodial, rather than educational reasons.

- **Enrollment of all children that are currently out of preschool education into 3–4 hour programmes would require investment of maximum 46 million EUR.**
  The cost of the 3–4 hour free of charge programmes for all children 3–5.5 years old presents around 60% of the current funds provided by municipal budgets for preschool education.
  Participation of parents in cost sharing should remain for children using full-day programmes. The Ministry of Education could propose a national set of criteria for fee reduction and fee waiving for the full-day programmes, based on equity principles. There is also scope to increase share of full-day programme costs paid by parents, based on their wealth status.

Recommendations related to data

Inconsistencies in the available data and lack of adequate data were noted throughout the process of development of this study. In order to improve the situation and enable future more precise calculations and analysis as a basis for policy making related to preschool education, some additional recommendations are made:

- The Statistical Office of the Republic of Serbia and the Ministry of Education, Science and Technological Development should harmonize methodologies of data collection, processing and presentation in the area of preschool education. It is particularly important to align the frequency of data collection, in terms of school versus calendar years.

- Preschool education statistics should be further aligned with international, particularly EU practice to enable comparison between countries.

- Instruments for data collection should be revised to include parameters that will enable analysis per different types of preschool programmes in relation to number of children attending, gender and type of settlements.

- Ways should be found to improve availability of data on children from vulnerable groups in preschool education.

- Information on preschool expenditures from Treasury should be available not only across different expenditures categories but also across different preschool education programmes (crèche, kindergarten, PPP) and more aligned with accountancy of preschool institutions.

LIST OF ABBREVIATIONS

BR (2010)	Baucal and Ranković (2010)
CEE/CIS	Central and Eastern Europe/Commonwealth of Independent State
CPI	Consumer Price Index
ECD	Early Childhood Development
EFA	UNESCO programme Education for All
ES	Educational Statistic
GDP	Gross Development Product
IDP	Internally Displaced Persons
IMPRES	Improvement of Preschool Education Project in Serbia
ISCED	International Standard Classification of Education
LFES	Law on the Fundamentals of the Education System
LPE	Law on Preschool Education
MDG	Millennium Developmental Goals
MICS	Multiple Indicator Cluster Survey
MoB	Memorandum on Budget
MoE	Ministry of Education
MPS	Ministry of Education of the Republic of Serbia (Ministarstvo Prosvete Republike Srbije)
NBS	National Bank of Serbia
NPA	National Plan of Action for Children
NMDG	National Millennium Development Goals
OECD	Organisation for Economic Co-operation and Development
PISA	OECD Programme for International Student Assessment
PE	Preschool Education
PI	Preschool Institution
PPP	Preschool Preparatory Programme
PRSP	Poverty Reduction Strategy Paper
RSO	Republic Statistical Office
RZS	Republic Statistical Office (Republički Zavod za Statistiku)
TCPE	Total Costs of Preschool Education
UCPE	Unit Costs of Preschool Education
VR (2010)	Van Ravens (2010)

LIST OF TABLES

Table 1. Coverage of children by preschool education in 2010/2011

Table 2. Coverage by preschool education for children from 3 to 5.5 years

Table 3. Average coverage of children from 3 to 5.5 years by different types of PE programmes in years 2007, 2008 and 2009

Table 4. Number of children not accepted due to the lack of capacity, accepted over capacity, and the shortage of places

Table 5. Number of children, groups, buildings and public preschool institutions

Table 6. Type of ownership in preschool education in 2010/2011

Table 7. Average number of children per group and educator in 2010/2011

Table 8. Education Spending by Level of Government in 2005 as % of GDP (in 000 dinars)

Table 9. Average actual total costs of PE in Serbia, in the period from 2007 to 2009 (in RSD and EUR)

Table 10. Broad categories of preschool expenditures from the Treasury, as recorded under the function 911 (preschool)

Table 11. Unit costs of PE per child per year by type of preschool programme; in DIN (top panel) and in EUR (bottom panel)

Table 12. Total costs of the universal PE policy, for children 3–5.5 years

Table 13. Total costs of the universal PE policy, for children 4–5.5 years

Table 14. Total costs of the universal PE policy, for children 3–4 years

Table 15. Total costs of the universal PE access into three-hour programmes, for children 3–5.5 years

Table 16. Distribution of 100 children between ages 3–5.5 years, taking into account percentage of children living in municipalities with different "level of development"

Table 17. Division of costs of universal free-of-charge three-hour programmes by the national and municipal Governments, taking into account percentage of children living in municipalities categorized according to the "level of development"

Table 18. Number of children 3–5.5 years by level of municipal development and PE enrolment

Table 19. Total costs of three-hour programmes for children 3–5.5 years, currently not in PE, per level of municipal development

Table 20. GDP growth and available resources for preschool education under two scenarios

Table 21. Total costs of the universal PE policy, for children 3–5.5 years

Table 22. Calculation of annual revenues from user fees, considering two scenarios

Table 23. Calculation of efficiency gains in KG, considering two scenarios

Table 24. Calculation of gains resulting from raising the fee for full-day KG paid by parents

Table 25. Cost-sharing scenarios (in million EUR): Full-day programme

Table 26. Cost-sharing scenarios (in million EUR): Half-day programme

Table 27. Cost-sharing scenarios (in million EUR): Three-hour programme

Table 28. Maximum (average) number of children per group in public preschool institution by age categories in school year 2010/2011

Table 29. Number of children and number of groups in each age cohort in Serbia in 2010/11

Table 30. Total number of children in the age category 3–5.5 years in the period 2007–2009

Table 31. Monthly economic cost per child for a full-day preschool education programme for children aged 3–5.5 years

Table 32. Monthly economic cost per child for a half-day preschool education programme for children aged 3–5.5 years.

Table 33. Preschool expenditures categories which constitute the economic cost per child for a full-day preschool education programme for children aged 3–5.5 years (in 2010/2011 din)

Table 34. Preschool expenditures categories which constitute the economic cost per child for a full-day preschool education programme for children aged 3–5.5 years (in %)

Table 35. Number of parents who get part or all of the preschool expenses for a full-day preschool education programme for children aged 3–5.5 years reimbursed (in %)

Table 36. Number of parents who get part or all of the preschool expenses for a full-day preschool education programme for children aged 3–5.5 years reimbursed

Table 37. Territorial differences at municipality level in terms of preschool coverage and children/group ratio in 2010/2011

LIST OF FIGURES

Figure 1. Early learning has the biggest impact, especially for the poorest

Figure 2. Time pattern for brain synapse formation for three core functions

Figure 3. Absolute number of children in preschool education by age category

Figure 4. Net enrolment ratio in PE ages 3–5.5, by programme in 2007 to 2009

Figure 5. Preschool education: population and enrolment trends/forecasts under assumption that the same increasing trend observed in the 2006/2007 until 2010/2011 periods will be continued until year 2020

Figure 6. Coverage of children from 3 to 5.5 years and number of children from 3 to 5 years per group in preschool institutions, per municipality in year 2010/2011

Figure 7. Children in and out of PE by level of development in Serbia in 2010

Figure 8. Preschool access at age 3–5 by place of residence (2010)

Figure 9. Preschool access at age 3–5 by family wealth status (2010)

Figure 10. Preschool access at age 3–5 by level of education of the mother (2010)

Figure 11. Preschool access at age 3–5 — Comparison of general and population from Roma settlements (2010)

Figure 12. Participation rates of 4 year-olds in pre-primary and primary education (ISCED 0–1) in European countries and in Serbia (year 2006)

Figure 13. Number of children not accepted due to the lack of capacity, accepted over capacity, and the shortage of places

Figure 14. Reasons for preschool non-attendance, children from 3 to 4 years — Comparison of general and population from Roma settlements, multiple answers

Figure 15. Development of Serbian GDP (level and growth rate)

Figure 16. PE unit costs as a share of per capita GDP in selected countries

Figure 17. Actual population size (until 2008) and forecasts (until 2032) for two cohorts (0–3 and 3–6 years old) relevant for two tiers of the preschool education (child care service and kindergartens)

Figure 18. Population pyramid in Serbia, across age and gender, 2010 estimates (%)

Figure 19. Population pyramid in Serbia, across age and gender, 2032 estimates (%)

INTRODUCTION

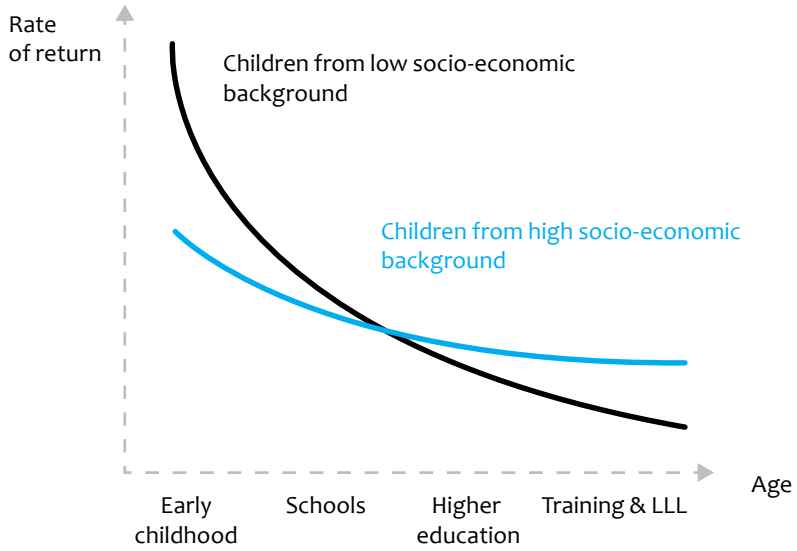
For almost a decade now, preschool education in Serbia is recognized as an important factor necessary for solving the problem of poverty and social exclusion. The National Millennium Development Goals (NMDG, 2006) specify that until 2015, 70% of children from 3 to 7 should be in preschool education, with a special focus on children from marginalized groups. The NMDG (2006) also plans to double the number of preschool institutions, with uniform geographical distribution. Further, Draft National Strategy of Education Development in Serbia until 2020 (preschool education is part of it) implies that until 2020, 75% of children from 3 to 5.5 years should be in preschool education. Recently adopted legal framework (the Law on the Fundamentals of the Education System, 2009, with Supplements and Amendments made in June 2011; the Law on Preschool Education, 2010; and the Book of Regulations of Fundamentals for Preschool Programmes, 2006) establishes a basis for inclusion of children into all levels of education including preschool. However, although coverage of children from 5.5 to 6.5 years by the compulsory Preschool Preparatory Programme (PPP) is currently close to 90%, coverage of children from 3 to 5.5 years is low (around 40–50%) and even lower among children from marginalized groups (children from rural areas, Roma children, and children with special needs). This is alarming and calls for action. The aim of this report is to investigate the financial feasibility and different costing scenarios in order to provide universal access to preschool education of children in Serbia in the age group between 3 and 5.5 years.

Current literature in psychology and economics stresses the importance of investing in young children. "Recent studies of early childhood investments have shown remarkable success and indicate that interventions in the early years are important for promoting learning and can be enriched through external channels. Early childhood interventions of high quality have lasting effects on learning and motivation. (…) Learning is a dynamic process and is most effective when it begins at a young age and continues through to adulthood," (Heckman, 2000). Society or the individual can invest in education at different points in the individual's life: early childhood, primary or secondary school, university education, on-the-job training, etc. Investments in education at different points in the life cycle may give very different rates of return or private/social benefits to education. Since much of cognitive functioning is well established by the time the child is age four or five, with the implication that the rate of return to investments in primary school is much lower, it means that investments in education at the preschool level may bring much higher long-term private and social benefits (Heckman, 2007; Heckman and Masterov, 2007).

The Crucial Role of Preschool Education for Children from Marginalized Groups

Heckman, the Nobel Prize Laureate in economics, found that investment in learning in the early years yields much higher returns than investment later in life (Heckman, 2000). As an illustration of this, Figure 1 is an adaptation of the Heckman curve by Woessmann (2006), depicting the enhanced effect of early learning when it concerns children from low socio-economic background. These children, as numerous studies have shown, benefit even more from PE than other children. For example, when the parents — especially the mother — have a low level of education, and if this goes hand in hand with a home environment poor of stimuli, then preschool attendance of even three hours per day can have a tremendous impact, at relatively low costs.

Figure 1. **Early learning has the biggest impact, especially for the poorest**



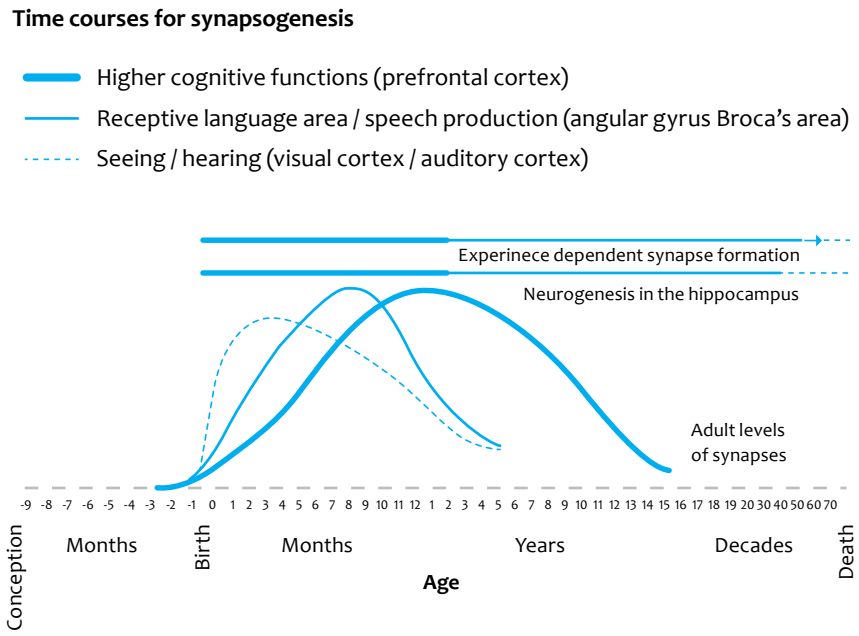
Source: Adaptation of the Heckman curve from Woessmann (2006)

Summarizing benefits of early intervention programmes found in the literature, Lynch (2005) writes that those children who participate in high-quality ECD programs tend to: perform better at school, measured through test scores in reading and mathematics; have better language abilities; have lower school dropout and grade retention rates; have less need for some form of special and compensatory education; have higher school completion rates and accumulate more human capital over the life cycle; have better nutrition and health outcomes; experience less child abuse and neglect; have lower probability of becoming teenage parents; have lower rate of alcohol and drugs abuse; have lower incidence of criminal behaviour in adolescence and adulthood; and have higher probability of employment and higher earnings in adulthood, which also means more tax income and lower dependence on governmental social welfare schemes. Using PISA data for Serbia and controlling for a battery of demographic and socio-economic variables, Vujić and Baronijan (2011) also show evidence that there exist a positive relationship between preschool attendance in Serbia and school performance measured through PISA tests in mathematics, reading, and science at the age of 15.

However, all these external effects — on learning, health, behaviour, productivity — would remain a black box if we would not know exactly what happens to these young children as they attend preschool. This is where research on brain development comes into the picture. Figure 2 shows the pattern of brain development from conception to age 16 for three main types of functions: sensing pathways (dotted curve), language (gray curve), and higher cognitive functions (black curve). We can see that early childhood is the unique period in which the brain develops the basis for further learning throughout life. The black curve — indicating higher cognitive function — peaks around the

preschool years. It is already on the decline upon entry in primary school, and around the age of 15 it approaches zero. This does not mean that cognitive development as such stops at that age. Obviously it continues. But the basis for it has nearly been completed at 15, for better or worse. This illustrates, for example, that early school leaving — though it occurs around the age of 16 — is best attacked during the preschool years, and at much lower costs. The same goes for achievement in high school and completion rates in higher education.

Figure 2. **Time pattern for brain synapse formation for three core functions**



Source: C. Nelson in Shonkoff and Phillips (Eds.) (2000), "From Neurons to Neighbourhoods"

This study focuses on children in the age cohort 3 to 5.5 years for two reasons. First, children in the age group from 5.5 to 6.5 years attend the compulsory PPP programme, which is free of charge and currently covers almost 90% of children in the targeted age cohorts (RSO DD20, 2010/11). After introduction of the PPP in 2006, coverage of children immediately below the new age limit for entrance into compulsory education (children between ages 4 and 5.5 years) became a priority.[1] Further, focus on children between ages 3 and 5.5 years is in accordance with the national (the First National Report on Social Inclusion and Poverty Reduction, Government of the Republic of Serbia, 2011) and international agreements (Strategic Framework for European Cooperation in Education and Training, "ET 2020"), identifying the benefits of collective forms of education and care for children in these age cohorts.

1 In most countries the increase of preschool education coverage starts from the oldest children who are below school entry age, introducing it gradually to children in lower age cohorts.

Second, while there is a consensus about the benefits of institutional child education starting from the age of 3 when spontaneous child development processes are connected with socialization needs in similar age groups, there is still no such consensus for the children younger than 3 years (Gonzalez–Mena, 2009; Engle et al., 2007). Further, crèche or kindergarten coverage of children younger than 3 years is also related to the employment status of mothers, legal framework regarding maternity leave, as well as child development function versus custodial function of crèche and/or kindergarten. Taking all these factors into account in order to calculate different costing scenarios of universal preschool education for children younger than 3 years in Serbia is beyond the scope of this report.

Methodological Remarks and Structure of the Report

Empirical analysis of this report used several data sources. Two main institutions which follow education statistics in general and preschool education statistics in particular are the Republic Statistical Office (RSO) and the Ministry of Education (MoE). Further, demographic numbers on children in preschool age cohorts (before the age of 7) are recorded by the RSO. The Treasury of the Republic of Serbia collects information on different preschool expenditures categories at the level of municipalities (function 911). The Multiple Indicator Cluster Survey (MICS4), conducted by the Statistical Office of the Republic of Serbia and UNICEF in 2010, is a large national survey occasionally used in this report as an additional source of preschool education statistics, particularly when the figures on preschool coverage from the RSO and the MoE significantly differed.

Calculation of different costing scenarios in order to provide universal access to preschool education of children in Serbia in the age group between 3 and 5.5 years took into account all Serbian municipalities for which data from all sources for the three analysed years (2007–2009) are available, such that the working sample of this report is 408 observations (136 municipalities over 3 years). Municipalities which are dropped from the analysis because data from the Treasury on these municipalities were missing in some of the analysed years are: Ada, Dimitrovgrad, Kladovo, Kruševac, Nova Crnja, Nova Varoš, Beočin, Bogatić, Prijepolje, Bor and Zemun (11 municipalities in total). This means that the whole data row on these municipalities is dropped from a merged data spreadsheet and the numbers on these municipalities do not enter the calculation of unit costs of PE in Serbia.

Municipality of Belgrade is treated as Belgrade, Zemun, and Lazarevac (i.e., the municipality of Belgrade includes all municipalities but Zemun and Lazarevac), while municipalities of Niš and Kragujevac are treated as one municipality. This has been done in accordance with the availability of the data from the Treasury, which only reports preschool education expenses at these geographical entities for Belgrade, Niš, and Kragujevac and it does not disaggregate preschool expenditures further.[2] The municipality of Surčin, which in the recent years has appeared as a separate municipality in the DD20 RSO preschool attendance data is treated as part of the municipality Zemun. Municipalities in Kosovo are dropped from the analysis.

2 For example, in the DD20 RSO data source, Belgrade is separated into Barajevo, Voždovac, Vračar, Grocka, Zvezdara, Zemun, Lazarevac, Mladenovac, Novi Beograd, Obrenovac, Palilula, Rakovica, Savski Venac, Sopot, Stari Grad, Čukarica, and Surčin (separate treatment of Surčin depends on the analysed year and type of data); Niš is separated into Niška Banja, Pantelej, Crveni Krst, Palilula, and Mediana; Kragujevac is separated into Kragujevac — city and Rača Kragujevačka.

Costing of different preschool education scenarios in this report has been performed on data in the period from 2007 to 2009, because of availability of all data sources (i.e., expenditures from the Treasury, demographic statistics, and preschool education coverage) across these three years at the municipality level. Ideally, we would have liked to use the most recent data (i.e., year 2010 or later), but the Treasury data later than 2009 were not readily available. Further, since some municipalities do not show up in the Treasury records in all recorded expenditure categories/years, pooling (appending) the data over three most recent years ensured better data reliability than if we have just focussed on one year (e.g., 2009).

In all costing scenarios we deflate preschool expenditures from the Treasury using the Consumer Price Index (CPI) provided by the Republic Statistical Office (RSO), with base period being December 2009. Deflated amounts in RSD are transformed into EUR using the National Bank of Serbia (NBS) average exchange rate in the period from 1st to 31st December 2009 (working and non-working days), whereby 1 RSD = 0.01041822 EUR.

This report is organised as follows. Starting from the strategic and legislative frameworks (Chapter 1), the report further reviews current situation in preschool education in Serbia (Chapter 2) and the reasons for low coverage of children in PE (Chapter3). Chapter 4 discusses current levels of public expenditures for PE and provides calculation of the unit cost of the 3-hour unit. Chapter 5 provides information on what would be the full cost of full coverage with PE for children 3–5.5 years through different scenarios and cost sharing modalities. Than in Chapter 6 we look what could be sources of resources needed to cover the funding gap and look into gains from GDP growth, efficiency gains and raising fees for full-day programs. In the Chapter 7, some thought on required human and physical capacities are shared. The final Chapter 8 draws some conclusions and recommendations.

1. STRATEGIC AND LEGISLATIVE FRAMEWORK FOR PRESCHOOL EDUCATION IN SERBIA

In this Chapter we provide an overview of the relevant strategic documents, the legal and normative framework for the functioning of the preschool education in Serbia, as well as characteristics of the preschool education in Serbia, with a brief comparison to the situation in EU.

1.1 National Strategy Documents

Poverty Reduction Strategy Paper (PRSP) in 2003 was the first strategic document which gave detailed analysis of the situation in preschool education in Serbia. This document stated that the main problems of preschool education were: low coverage of preschool education for children 0.5 to 7 years, especially for children from vulnerable groups,[3] and organization of preschool institutions as inflexible, big networks which were unable to adapt to local needs. This strategy paper identified increase of preschool coverage for children 0.5 to 7 years, development of alternative half-day programmes for children from 5 to 7 years, and introduction of obligatory Preschool Preparatory Programme (PPP) for children in the pre-primary school age cohort (5.5 to 6.5 years) as the main goals for the ECD in Serbia. Problems faced by preschool education in Serbia, first identified by the PRSP (2003), were discussed and confirmed in many other follow-up studies: Open Society Institute (OSI, 2007 and OSI, 2010),[4] Pešikan and Ivić (2009), Ivić, Pešikan and Jankov (2010), RECI (2011), and Baucal and Ranković (2010). The National Plan of Action for Children (NPA, 2004), the National Millennium Development Goals (NMDG, 2006), and the Draft National Strategy of Education Development in Serbia until 2020 followed and further developed strategic and legislative framework for preschool education in Serbia.

1.2 Legal and Normative Framework

Legal framework for preschool education in the Republic of Serbia consists of the following Laws: The Law on the Fundamentals of the Education System (LFES, 2009; with Supplements and Amendments made in June 2011), the Law on Preschool Education (LPE, 2010), and the Book of Regulations of Fundamentals for Preschool Programmes (BRFPP, 2006). The Memorandum on Budget of the Republic of Serbia (2009, 2010, and 2011) regulates budgetary expenses earmarked for education (preschool, primary, secondary, and tertiary education).

The main Law which regulates delivery of education in general is the Law on the Fundamentals of the Education System (LFES, 2009). This Law sets principles, goals, and standards for education, methods, and conditions for conducting preschool, primary and secondary education, organisation and financing of education, enforcement of educational curriculum, as well as other issues of importance

3 Vulnerable groups are defined as refugees and internally displaced persons, Roma people, poor people (people below national poverty line), persons from socially and educationally unprivileged rural areas, and persons with special needs.

4 Authors of these reports for Serbia are Jadranka Stojanović and Aleksandar Baucal.

to education and upbringing. The Law on Preschool Education (LPE, 2010) deals with preschool education in more detail. Finally, the Book of Regulations of Fundamentals for Preschool Programmes (BRFPP, 2006) defines the goals and the curriculum for preschool education, focusing in particular on the Preparatory Preschool Programme (PPP). More details about particular segments of these Laws can be found in Appendices A.1 and A.2.

From the wider perspective of Europe 2020 strategy[5] and considering the fact that coverage of children by preschool education in Serbia is much lower than in most EU countries (Pešikan and Ivić, 2009; Government of the Republic of Serbia, 2011, p. 126),[6] the national goals in this area were defined in order to be realistic and achievable. In the First National Report on Social Inclusion and Poverty Reduction (Government of the Republic of Serbia, 2011) and the Draft National Strategy of Education Development in Serbia until 2020 (preschool education is part of it), which defines the vision for the development of preschool education until 2020, as well as strategies for monitoring and enforcement of this vision, the national target for Serbia in terms of coverage of children by preschool education was defined to be 80% by 2020 (age group 4 to 5.5 years) and 75% (age group 3 to 5.5 years), respectively.[7]

Preschool education is financed according to the number of realized educational groups, mainly organised with respect to child's age. The price of the programme per group is determined based on the average net salary in Serbia for the accounting month, and the price of energy products, utilities, and transportation. The Budget of the Republic of Serbia covers expenses for the PPP, together with other expenses for primary, secondary, and tertiary education. Expenses for preschool education prior to the PPP (for children younger than 5.5 years) are covered by parents and local Governments, such that the local Governments cover 80% of the economic price per child, while the parents cover the remaining 20% of expenses. Local Governments are also obliged by the Law to provide and fund children's transportation to the nearest preschool education facility.

The national budget allocation to preschool education, expressed in relation to GDP, provides information on country's efforts to implement preschool education programmes and/or to provide such programmes with optimal working conditions. According to the most recent information available from existing literature, expenditures on education were 4.53% and expenditures for preschool education were 0.43% of the Serbian GDP in 2005, respectively (Levitas and Herczynski, 2006; Pešikan and Ivić, 2009).

5 In the European strategy for smart, sustainable and inclusive growth (Europe 2020, ec.europa.eu/eu2020/), educational policies represent a vital part. In a new Strategic Framework for European Cooperation in Education and Training, "ET 2020", one of the benchmarks specifies that "By 2020, at least 95% of children between 4 years and the compulsory primary education starting age should participate in early childhood education." However, this document also specifies that "these benchmarks should not be considered as concrete targets for individual countries to be reached by 2020. Rather, Member States are invited to consider, on the basis of national priorities and whilst taking account changing economic circumstances, how and to what extent they can contribute to the collective achievement of the European benchmarks through national actions."

6 According to Pešikan and Ivić (2009), in 2005 participation of children from 3 to 7 years in preschool education in Serbia was 39% and one of the lowest in Europe. According to the First National Report on Social Inclusion and Poverty Reduction (Government of the Republic of Serbia, 2011), coverage of children in the preschool education (ages 4 to 5.5 years) was 47% in comparison to 85% in EU in 2010.

7 Different strategic documents focus on different age groups of preschool children, which is a reflection of different contexts and priorities in particular time periods.

1.3 Characteristics of Preschool Education in Serbia

Preschool education covers children up to six and a half years and is organised in both public and private preschool institutions.[8] Preschool education is not obligatory for children up to 5.5 years. Until the age of 3 children go to the crèche, while between ages 3 and 5.5, children go to the kindergarten. Between 5.5 and 6.5 years, children attend compulsory Preparatory Preschool Programme (PPP), which is free of charge. Preschool education is organised in programmes of different length: longer than 8 hours a day, from 4 to 8 hours a day, and shorter than 4 hours a day (DD20 RSO, 2007/2008).[9]

According to the Serbian legislation, children who became 6 years old by the 1st of March of the current year, have to be enrolled into primary education in September of that year. This rule is setting the start of PPP one year before and is a basis for division of children into different age groups: 6.5 years and onwards — primary education; between 5.5 and 6.5 years — compulsory PPP; and younger to kindergarten and crèche.

The PPP was introduced in 2006 and was extended from six months to nine months in 2009. It should be performed in preschool institutions, providing there are available facilities, and otherwise in schools. Further, the PPP should be taught by educators from preschool rather than school institutions, since the main purpose of this programme is child development, rather than formal learning provided by school education (LFES, 2009, Article §93). Other policy measures which were introduced in order to promote preschool participation in general (for more details, see Appendix A.3), boosted as a consequence participation of children attending PPP. However, initiatives related to promoting non-compulsory preschool education attendance, for children up to 5.5 years, remained fairly limited. Further, defining PPP as an obligatory programme resulted in reduced available space for lower age groups.

Although preschool education has a long tradition in Serbia, the purpose of institutional upbringing and education in this age group (0.5 to 6.5 years) has changed significantly over the last 15 years. In 2001, preschool education legally became part of formal education in accordance with international educational classifications (Statistical yearbook, RSO, p. 360). This change is of special importance because the purpose of baby-sitting, looking-after, and nursing children as an assistance for working parents (custodial function of preschool education) has been replaced by a new preschool education (PE) concept which promotes children's early development and education (development function of preschool education). It has also become very important for the preschool education to increase coverage of children belonging to sensitive groups (children from low-income families, children from families with low socioeconomic and low-culture status, rural children, ethnic minority children and children with disabilities) (Ivić, Pešikan, and Jankov, 2010, p. 24).

8 Although the LPE (2010) defines the preschool age from six months, preschool institutions most often only accept children from 12 months onward.

9 It should be noted here that the RSO statistics collected information on preschool institutions programmes longer than 8 hours a day, from 5 to 9 hours a day, and shorter than 5 hours a day in 2009/2010, and longer than 9 hours a day, from 6 to 9 hours a day, and shorter than 6 hours a day in 2010/2011.

1.4 Comparison with the EU Countries

Similar to Serbia, in almost all EU-27 countries, preschool institutions went from traditional custodial centres to educational institutions which focus on child development (Early Childhood Education and Care in Europe: Tackling Social and Cultural Inequalities (ECEC, 2009)). However, although in some EU countries (e.g., the Netherlands, Luxembourg, UK, North Ireland, etc.), compulsory preschool education begins at the age of 4, in most OECD countries, pre-primary is universal from age 3 and exceptionally from age 4 or 5. In a number of countries, free education in preschools is guaranteed for all children starting from the age of 3 (e.g., France, Italy, Spain, Hungary, Greece, etc.). Free, compulsory preschool education in Serbia is only available to children from 5.5 years.

Average preschool expenditures across OECD countries were 0.5% of GDP in 2004, similar to the EU-19 countries which are also members of the OECD (Pešikan and Ivić, 2009). In Serbia the same number was 0.43% in 2006, which is lower than the average for the OECD or EU-19 countries which are also members of the OECD.

1.5 Chapter Summary

The analysis of the strategic and legal framework showed that Serbia has good policy basis that supports expansion of PE recognising its importance. The purpose of institutional upbringing and education of preschool age children (0.5–6.5 years) has changed significantly over the last 15 years, from primarily baby-sitting and looking after children to the concept that promotes children's early development and education. This concept is also reinforced by the draft National Education Development Strategy that is pending governmental adoption. Introduction of the compulsory Preparatory Preschool Program in 2006, for children 5.5 to 6.5 years, boosted participation of children attending PE, but only for this age group. National policies are also highlighting disparity in enrolment of different vulnerable groups as an issue that needs to be addressed systematically.

2. CURRENT SITUATION IN PRESCHOOL EDUCATION IN SERBIA

In this Chapter we provide information on the coverage of children by preschool education in Serbia (in 2010/2011, as well as years before 2010), and the coverage of children by preschool education coming from sensitive groups, such as children with disabilities, Roma children, and children from socially vulnerable groups. We also argue the importance of preschool education for these children. At the end of this chapter, we compare coverage by PE in Serbia in the past years to the situation in the EU countries.

2.1 Preschool Education Coverage in 2010/2011

Two main institutions which follow education statistics in general and preschool education statistics in particular are the Republic Statistical Office (RSO) and the Ministry of Education (MoE). Further, Multiple Indicator Cluster Survey (MICS4), conducted by the Statistical Office of the Republic of Serbia and UNICEF in 2010, is a large national survey occasionally used in this report as an additional source of preschool education statistics, particularly when the figures on preschool coverage from the RSO and the MoE significantly differ (for more details, see Appendix A.4).

According to the Republic Statistical Office (RSO), there were 392 thousands children up to 7 years of age in Serbia in 2010/2011. In the age cohort of interest in this study, 3 to 5.5 years, there were around 177 thousands children. Using data coming from different sources (RSO, MoE, and MICS4), Table 1 presents coverage of children by preschool education in different age groups (up to 3, 3–5.5, and 5.5–6.5 years) in 2010/2011. Although there are seemingly large differences in coverage of children enrolled in PPP, the numbers are very similar when it comes to coverage of the children up to 5.5 years, especially children from 3 to 5.5 years. Further, we can conclude that the coverage of children enrolled in PPP (children from 5.5 to 6.5 years) was very high (between 87% and 96%), while the coverage of children enrolled in crèche (children up to 3 years) was low (between 20% and 22%). The coverage of children enrolled in kindergarten was 48%, according to both RSO and MoE data. This means that there are still about 50% of children from 3 to 5.5 years not covered by the preschool education in the form of kindergarten. Further, in order to achieve Draft National Strategy of Education Development in Serbia until 2020 (preschool education is part of it), which implies that until 2020, 75% of children from 3 to 5.5 years should be in preschool education, the current coverage needs to be increased by additional 25%.

Table 1. **Coverage of children by preschool education in 2010/2011**

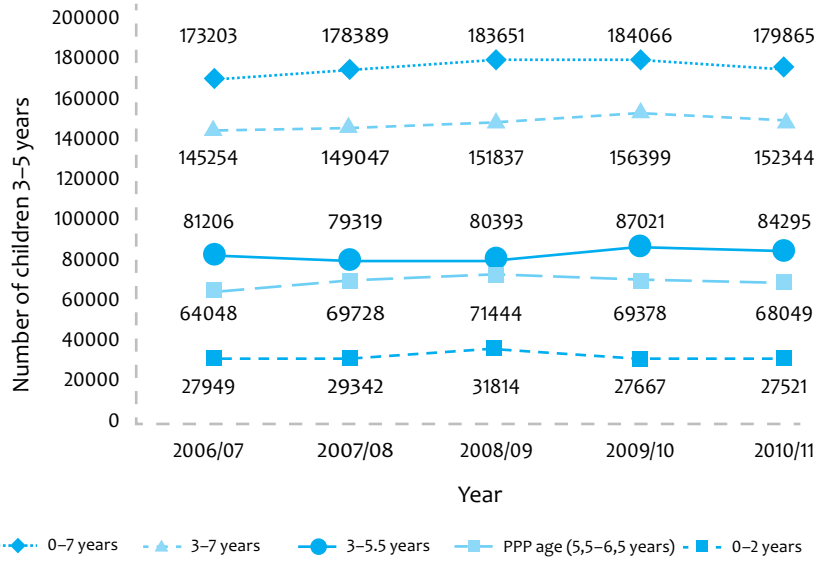
	Crèche (up to 3 yrs)	Kindergarten (3–5.5 yrs)	PPP (5.5–6.5 yrs)
Number of live births	137,777	176,557	77,731
Enrolment in absolute numbers; RSO data	27,521	84,295	68,049
Enrolment rate; based on RSO data	20.0%	47.7%	87.5%
Enrolment in absolute numbers; MoE data	29,969	84,923	74,681
Enrolment rate; MoE data (only public inst.)	21.8%	48.1%	96.1%
Attendance rate; MICS4 household survey	–	43.8%	95.8%

Notes: MICS4 data are recorded for children from 36 to 59 months, which is from 3 to 5 years.
Source: Demographic Yearbook 2010 and DD20 for 2010/11, RSO. Number of live births for children from 0 to 3 years represents the number of children born from 1st September 2007 to 1st September 2009, for children from 3 to 5.5 years represents the number of children born from 1st March 2005 to 1st September 2007, and for children from 5.5 to 6.5 years represents the number of children born from 1st March 2004 to 1st March 2005.
Source: Analysis of preschool education and PPP, MoE (2011), p. 12.

2.2 Preschool Education Coverage Prior to 2010/2011

Figure 3 shows that the absolute number of children up to 7 years in compulsory and non-compulsory preschool education (PE) had an increasing trend in the period between 2006 and 2009, plateauing out in 2010/2011.

Figure 3. **Absolute number of children in preschool education by age category**



Source: Spreadsheets 2 and 3, DD20 RSO for respective year, RSO.

Table 2 shows the authors' calculations of the PE coverage of children from 3 to 5.5 years for the last 5 years (from 2006/2007 to 2010/2011) for which the data were available. The RSO data show an increase of children covered by the preschool education in Serbia in the last several years. The MICS4 data also show significant improvement in children preschool participation in the last 5 years. According to this data source, PE coverage of children aged 36–59 months (3 to 5 years) increased from 33% in 2005 to 44% in 2011 (increase of 11 percentage points). However, in absolute numbers, enrolment hardly changed or even declined (Figure 3). The explanation is decreasing population (see Figure 17). Therefore the increased participation is caused by a decrease in the denominator (decreasing population) rather than an increase in the numerator (PE enrolment). Data prior to 2010 confirm that the coverage of preschool education in the age cohort 3 to 5.5 years is moderate and that there is space for improvement.

Table 2. **Coverage by preschool education for children from 3 to 5.5 years**

		Number of live births	Number of children in PE 3–5.5 years	Enrolment rate of children 3–5.5 years (3–5 years MICS)
		(1)	(2)	(3)
RSO	2006/2007	196,210	81,206	41.4
	2007/2008	196,531	79,319	40.4
	2008/2009	193,356	80,393	41.6
	2009/2010	185,316	87,021	47.0
	2010/2011	176,557	84,295	47.7
MICS*	2005/2006			33.0
	2010/2011			44.0
MoE	2010/2011	176,557	84,923	48.1

Notes: Column 1: Number of live births, Demographic Yearbook 2010, RSO. Column 2: Number of children in preschool 3–7 (Spreadsheet 2); Number of children in PPP (Spreadsheet 3), DD20 for respective year, RSO. Column 3: Authors' calculations and MICS3 and MICS4 data (children 3–5 years).

When we break down the coverage of children from 3 to 5.5 years by the type of preschool stay (full-day, half-day or three hours), over years 2007 to 2009 (Table 3), we see that most children from 3 to 5.5 years (almost two thirds) went into full-day PE programme and only a small percentage of children in this age group attended three-hour programme (only about 3% of children out of all children from 3 to 5.5 years in PE).

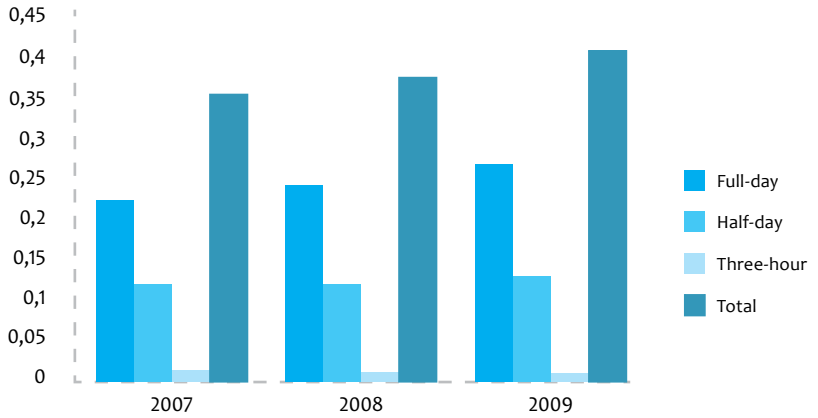
Table 3. **Average coverage of children from 3 to 5.5 years by different types of PE programmes in years 2007, 2008 and 2009**

	% of children 3–5.5 years in PE out of all children in PE	% of children 3–5.5 years in PE out of all children 3–5.5 years in PE	% of children 3–5.5 years in PE out of all children in this age category
	(1)	(2)	(3)
Full day	28	63	24
Half-day	15	34	12
3-hour	1	3	1
Total	44	100	38

Notes: Column (1) denotes the number of children aged 3–5.5 years in preschool education in relation to the total number of children enrolled in preschool education. Column (2) denotes the number of children aged 3–5.5 years in preschool education in relation to the total number of children aged 3–5.5 years enrolled in preschool education. Column (3) denotes the number of children aged 3–5.5 years in preschool education in relation to the total number of children aged 3–5.5 years.

In Figure 4 it can be seen that there is a slow but steady increase in overall PE enrolment (grayish blue), mainly driven by growth of the full-day programme (blue). Enrolment in the half-day programme (darker light blue) grows only slowly, while the three-hour programme enrolment (lighter light blue) actually declines.

Figure 4. **Net enrolment ratio in PE ages 3–5.5, by programme in 2007 to 2009**



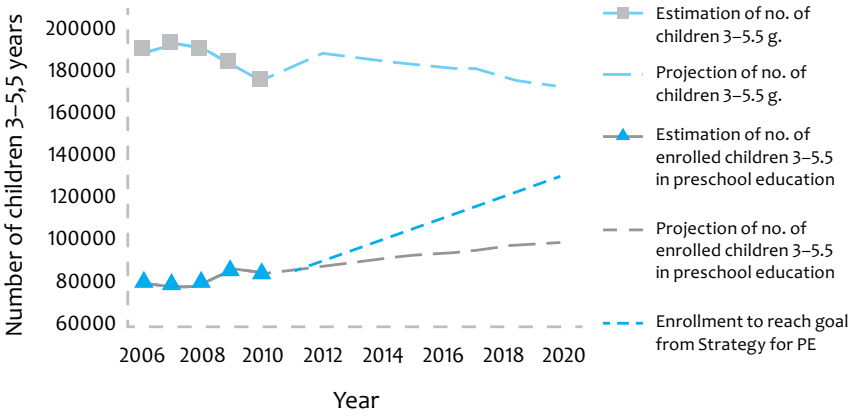
Source: DD20 RSO for prospective years. Authors' calculations

In Table 2, which shows coverage of preschool education for children from 3 to 5.5 years, we see that both MICS4 and RSO data show an increasing trend in preschool education coverage of children in this age group (from 33% in 2005/2006 to 44% in 2010/2011, according to the MICS data, and from

41.4% in 2006/2007 to 47.7% in 2010/2011, according to the RSO data). This increasing trend in preschool education coverage of children from 3 to 5.5 years of approximately 6 percentage points over the last 5 years (i.e., about 3% annually) according to the RSO data can partly be explained by a negative population trend in this age group[10] and partly by an increase in absolute number of children entering the preschool system. If this trend continues, the preschool education coverage of children from 3 to 5.5 years will be higher in 2020 (at around 57%) than today without any additional interventions in preschool education.

However, in order to achieve the Draft National Strategy of Education Development goal in Serbia until 2020 (preschool education coverage of 75% for children from 3 to 5.5 years by 2020), some measures need to be taken with respect to these cohorts of children (see Figure 5). For example, under current negative demographic trend, in order to reach the Strategy 2020 goal of 75%, PE enrolment growth rate should be 4.6% per year, while in order to have all children from 3 to 5.5 years enrolled into PE by 2020, PE enrolment growth rate should be 7.6% per year.

Figure 5. **Preschool education: population and enrolment trends/forecasts under assumption that the same increasing trend observed in the 2006/2007 until 2010/2011 periods will be continued until year 2020**



Notes: Blue line: RSO estimated population numbers for middle of the year, Demographic Yearbook for respective year and RSO projections for 2012, 2017 and 2022 for age groups 0–4 and 5–9, Demographic Yearbook, 2009, RSO; Pink line: Number of children in preschool 3–7 (Spreadsheet 2) — Number of children in PPP (Spreadsheet 3), DD20 for respective year, RSO and Authors' projection based on the trend observed from 2006 until 2010. Projection is based on the Excel function TREND, which uses the ordinary least squares (OLS) method for determining the best fit for the data. Dependent variable is a number of children 3–5.5 years enrolled into PE, regressed on a linear trend only. Regression is based on 5 observations, from 2006 to 2010.

10 Negative population trend is –1.4% in 2008, –3.8% in 2009 and –4.1% in 2010. This negative trend will continue in the following years as well, at an average growth rate of –1.1% between 2013 and 2020.

2.3 Regional Differences in Enrolment and Average Number of Children per Group

According to Ivić, Pešikan and Jankov (2010), preschool institutions in Serbia are unevenly geographically distributed, such that the preschool institutions are absent in places where there is the highest need for stimulation of children's early development (i.e., in underdeveloped, low-income, and rural areas). Study of Baucal and Ranković (2010) analyses regional differences in preschool education coverage of children from 3 to 7 years and shows that there are significant regional differences in enrolment rates and average number of children per group. For example, using data for 2008, when the national enrolment rate of children from 3 to 7 years in preschool education was 40% and the national average of the number of children per PE group was 21, Baucal and Ranković (2010) find that in regions like South-Bačka and Belgrade, enrolment rates and average number of children per group for 3 to 7 year-old children are higher than the national average numbers (55% for the enrolment rates and 23 children per PE group). At the same time, in regions like Pčinjski, enrolment rate is far below the national average (23%), while the average number of children per group is lower than the national average (19 children per group).

Similar to Baucal and Ranković (2010), Figure 6 shows territorial differences in coverage of children from 3 to 5.5 years by preschool education and average number of children per group based on several data sources in 2010/2011 (for more details on data sources, see Appendix A.4). Taking 21 children per group as a benchmark,[11] all municipalities with number of children per group lower than 21 are on the left hand side in Figure 6. They could be treated as municipalities where preschool enrolment could be improved even within the existing capacities (assuming that existing capacities in this group of municipalities are in average at the same level like in other municipalities). On the right hand side in Figure 6 are municipalities with number of children per group higher than 21. In these municipalities improvement of preschool enrolment would require new capacities. Municipalities where enrolment rates are higher than the national average are on the upper side of the chart, while municipalities where enrolment rates are lower than the national average are on the lower side in Figure 6.[12]

In this way we divided all municipalities into four segments in Figure 6,[13] according to the number of children per group and enrolment rate:

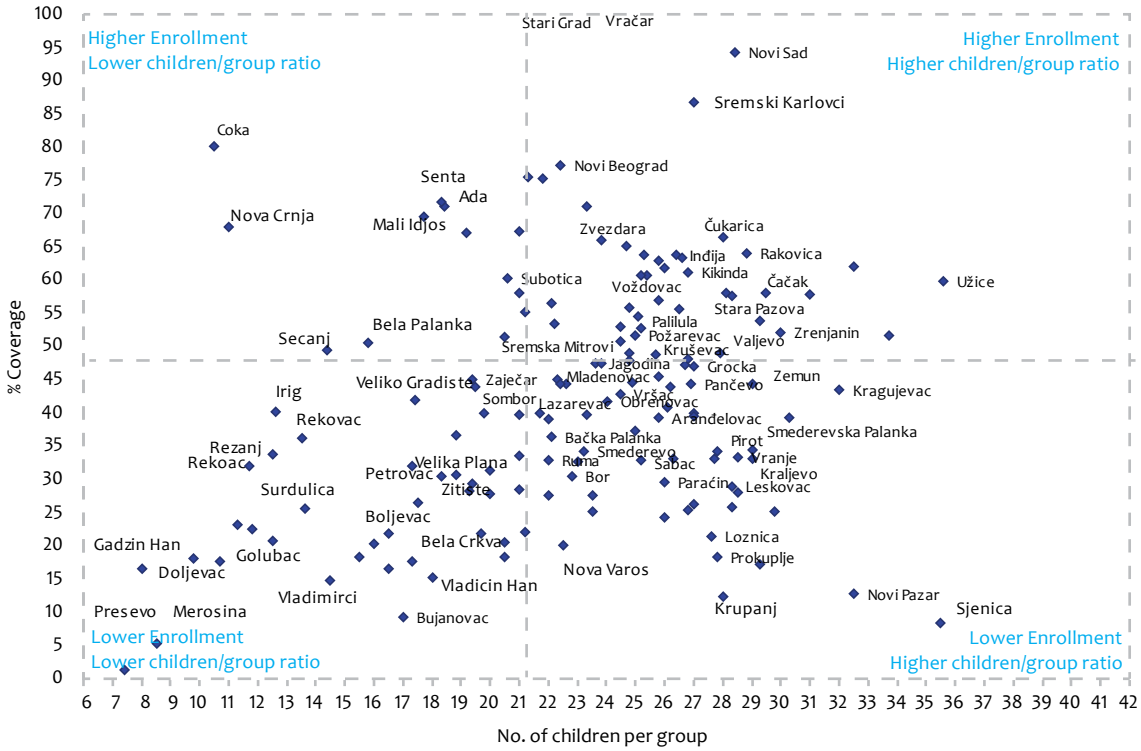
- Higher enrolment rates — lower children/group ratio (upper left);
- Higher enrolment rates — higher children/group ratio (upper right);
- Lower enrolment rates — lower children/group ratio (lower left);
- Lower enrolment rates — higher children/group ratio (lower right).

11 The Law on Preschool Education defines a maximum number of children per group in each age cohort, such that the norm for a number of children from 3 to 4 years (from 4 to 5 years) is 20 (22) children per group, respectively (see Table 28 in Appendix). In year 2010/2011, at the national level, average number of children from 3 to 5.5 years per preschool group was 25.

12 The national average for PE enrolment rates in the age group of children between 3 and 5.5 years in this analysis is somewhat different then the one presented in Table 3 (47.7% compared to 47.4%). The difference occurs because the calculation of the PE enrolment rate at the national level uses the number of live born children as a denominator, whereas the calculation of the PE enrolment rate at the municipality level uses the number of children of corresponding age in each municipality as a denominator. At the municipality level, the estimated number of children gives more accurate figures due to internal migrations.

13 Due to visibility we did not present all municipalities in Serbia on the chart. A list with all municipalities and their position on the chart is given in Appendix.

Figure 6. **Coverage of children from 3 to 5.5 years and number of children from 3 to 5 years per group in preschool institutions, per municipality in year 2010/2011**



Division of municipalities into four segments would imply different policy recommendations that are discussed in Chapter 7.

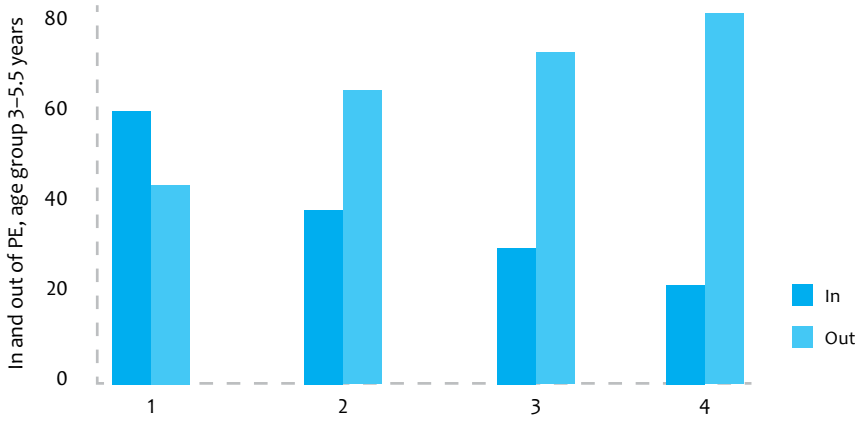
Municipalities which had the highest coverage of children by preschool education (more than 50%) in 2010/2011 were located in Belgrade or Vojvodina (North part of Serbia). Zooming into municipalities which had very low enrolment rates (less than 20%), which is much less than the national average of 48% in 2010/2011 (Bogatić, Bojnik, Bosilegrad, Bujanovac, Doljevac, Gadžin Han, Knić, Kovin, Krupanj, Lebane, Malo Crniće, Merošina, Novi Pazar, Preševo, Prokuplje, Sjenica, Tutin, Varvarin, Vladičin Han, Vladimirci, and Žitorađa), 76% of these municipalities fall into a group of 'devastated municipalities', with a level of development below 50% of the national average, according to the Law on Regional development (described in Appendix A.4).

"Level of development" of municipalities is measured using a composite indicator, which is based on income and budgets, on the growth or decline of the population, on the unemployment rate, on inhabitants' education level, and on the presence of urban areas within the municipality. All of these indicators are very relevant to preschool. Municipalities are then classified into 4 groups depending on the level of their development (see also Appendix A.4):

- Group 1: level of development above the national average
- Group 2: level of development between 80% and 100% of the national average
- Group 3: level of development between 60% do 80% of the national average
- Group 4: level of development below 60% of the national average.

Figure 7 shows proportions of children in and out of preschool in the age group 3 to 5.5 years by level of development of municipalities in which they live and go to preschool.

Figure 7. **Children in and out of PE by level of development in Serbia in 2010 (age group 3–5.5 years)**



Source: DD20 RSO (2010) and Authors' calculations

We can see that the preschool enrolment is lowest in municipalities which belong to Group 4 (most municipalities in Group 4 are also "devastated municipalities", with a level of development below 50% of the national average). Put differently, municipalities in Group4 which have relatively poorer and lower educated parents than other municipalities in Groups 1, 2 and 3, have the highest proportion of children out of preschool. This categorization of municipalities by level of development could be a basis for positive action and differentiated mechanisms of costing scenarios (see Chapter 5).

2.4 Preschool Education Coverage of Children from Marginalized Groups

According to the Poverty Reduction Strategy Paper (PRSP, 2009), marginalized groups encompass refugees and internally displaced persons, Roma people, poor persons, persons from socially and educationally unprivileged rural areas and persons with disabilities. Previous studies (Pešikan and Ivić, 2009; Baucal and Ranković, 2010) suggest that preschool coverage of marginalized groups of children,

who need education most, is quite low. The National MDG for preschool education — 70% by 2015 — also includes the ambition to focus on marginalized groups: children in rural areas, Roma children and children with special needs. Currently, the disparities in preschool access in Serbia are significant, and they are always to the disadvantage of those children who are most in need of the service, seen from the child development perspective. However, it is difficult to talk more in detail about the preschool coverage of marginalized groups of children because of the lack of data at a more disaggregate level. Nevertheless, in what follows, we provide some information on preschool coverage of children with disabilities, children from socially vulnerable groups and Roma children, based on available data from the Ministry of Education (MoE) and the MICS4 (UNICEF, 2011) survey.

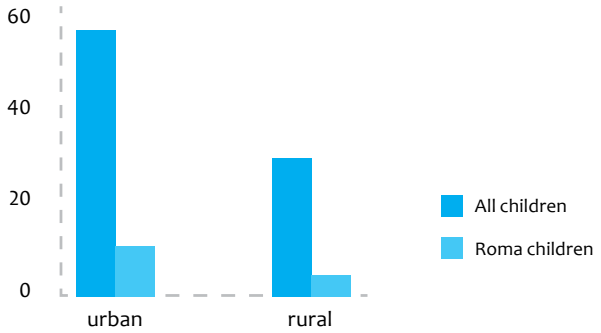
Children with Disabilities

Ministry of Education (MoE) collects information on the total number of preschool children with disabilities registered in preschool institutions. According to the MoE, 2,141 children with disabilities from 1 to 6 years participated in the preschool education system in 2010/11. Out of this number, 1,057 children with disabilities participated in education as children treated in a hospital, 328 children with disabilities attended development groups, and 756 attended educational groups, which have been covered by the Individual Education Plan (IVOP). Study of Ivić, Pešikan and Jankov 2010, which uses information of the Statistical Office of the Republic of Serbia, finds that 1.21% of children with disabilities attend some sort of preschool education programmes. Considering that the total percentage of children with disabilities is higher (about 5%), it is likely that PE enrolment rate for children with disabilities is about 25%, which is significantly lower than PE enrolment for all children (Ivić, Pešikan, and Jankov, 2010).

Children from Socially Vulnerable Groups

Statistical Office of the Republic of Serbia and UNICEF (2011), MICS4 survey, provides information on preschool coverage of socially vulnerable groups. Figure 8 shows that the preschool attendance of rural children between 3 and 5 years of age is much lower compared to urban children (7% and 29% respectively).

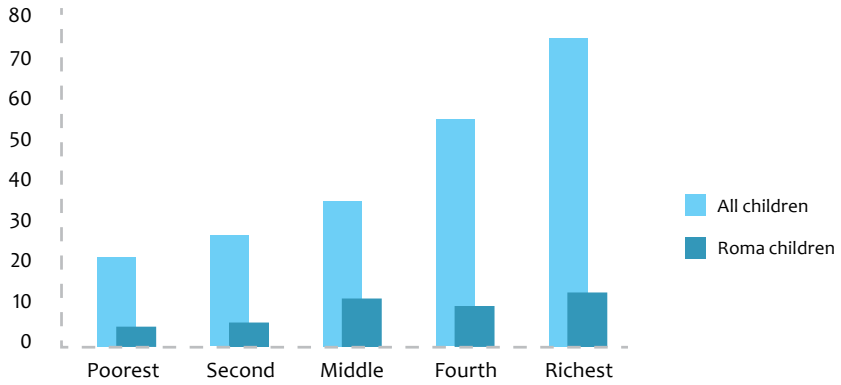
Figure 8. **Preschool access at age 3–5 by place of residence (2010)**



Source: MICS4, UNICEF (2011)

Further, Figure 9 shows that the PE access in the fifth quintile (20% the richest) is three times higher than in the first quintile (20% the poorest) — 22% of children from the first quintile of the poorest families attend preschool education compared to 75% of children from the fifth, the richest quintile.

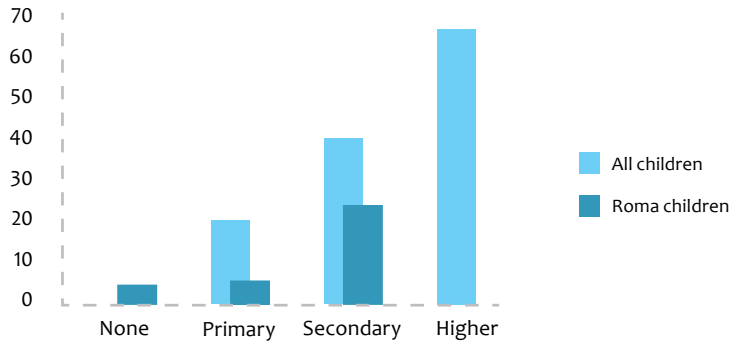
Figure 9. **Preschool access at age 3–5 by family wealth status (2010)**



Source: MICS4, UNICEF (2011)

Perhaps the most important background indicator is the education level of children's parents, especially that of the mother. Therefore, what we would want to see, from a child development perspective, is that access is the highest for the children with low educated mothers. Yet, precisely the reverse is the case, as Figure 10 shows: only 21% of children whose mothers have completed elementary or vocational education attend preschool education compared to 67% of children whose mothers are highly educated.

Figure 10. **Preschool access at age 3–5 by level of education of the mother (2010)**

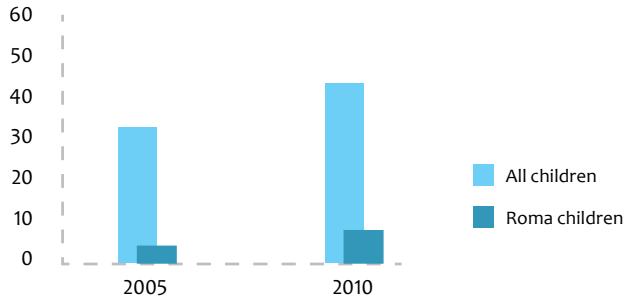


Source: MICS4, UNICEF (2011)

Roma Children

According to the MoE data, 3,650 Roma children were registered in preschool education in 2010/2011 (334 children aged 1 to 3 years; 658 children aged 3 to 5.5 years; and 2,641 children aged 5.5 to 6.5 years).[14] Based on MICS4 (2011) data, Figure 11 shows that in 2010 the coverage of children from Roma settlements between 3 and 5 years was 8.2% in comparison to 43.8% overall enrolment rate of children 3–5.5 years. Although the coverage is still very low, it is an increase from 2005 when the preschool coverage of Roma children in the same age group was only 3.9%.

Figure 11. **Preschool access at age 3–5 — Comparison of general and population from Roma settlements (2010)**



Source: MICS4, UNICEF (2011)

Previous figures (Figures 8, 9, and 10) showed that enrolment of Roma children into PE is influenced by the same background variables (place of residence, wealth status, mother's education) like was the case for children from general population. However, coverage of Roma children is by far lower in each of the observation categories compared to the general population.

2.5 Comparison with the EU Countries

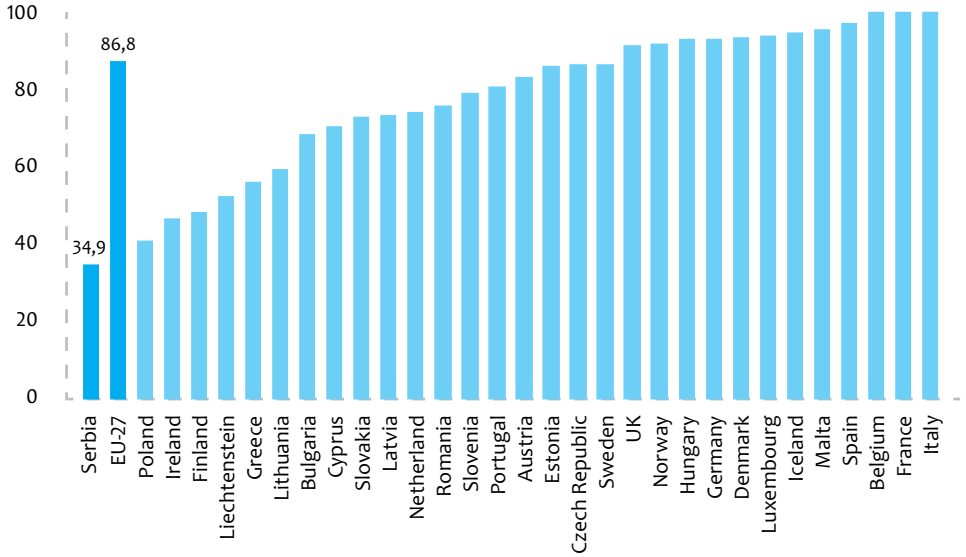
In comparison to the EU countries, preschool coverage of children in all preschool age cohorts, and particularly of children in the age cohort from 3 to 5.5 years, which is a focus of this report, is quite low in Serbia. For example, coverage of children in the preschool education (ages 4 to 5.5 years) was 85% in EU in 2010 (Government of the Republic of Serbia, The First National Report on Social Inclusion and Poverty Reduction in the Republic of Serbia, 2011, p. 126). Considering that draft National Education Development Strategy gives different enrolment priority to children 3 and 4 years old, in what follows, we also show information for 3 and 4 year-old children separately. For example, in EU-27 countries in 2005/2006, average coverage by preschool education of 3 and 4 year-old children was 74% and 87%, respectively

14 These figures are much lower than survey results from MICS4 (2011), probably indicating underreporting of individuals of ethnic background other than Serbian in administrative data.

(ECEC in Europe, 2009, p. 65). In comparison, in Serbia in 2010/2011, the preschool education coverage of 3 and 4 year-old children was 37% and 42%, respectively (RSO estimates).[15] The MICS4 (UNICEF, 2011) data show similar numbers for Serbia in 2010/2011; the preschool education coverage of 3 and 4 year-old children was 38.6% and 48.5%, respectively.

The Figure 12 from Baucal and Ranković (2010) shows that on average, in EU-27 countries about 87% of 4 year-old children have participated in some form of education (ISCED 0 or ISCED 1)[16] in 2006. In comparison the enrolment rate of 4 year-old children in Serbia in 2006 was 34.9%, i.e. much lower than in other European countries.

Figure 12. **Participation rates of 4 year-olds in pre-primary and primary education (ISCED 0–1) in European countries and in Serbia (year 2006)**



Notes: Source: Baucal and Ranković (2010).

Although children from different vulnerable groups need the services of preschool institutions the most, the preschool coverage of these children is among the lowest. However, observed situation is not specific only to Serbia. In other EU countries, the preschool coverage of children coming from vulnerable groups is also very low and only a few countries have special preschool programmes for these children. Further, in many EU countries better preschool coverage of disadvantaged groups of children is on the current EU agenda (ECEC in Europe, 2009).

15 According to the RSO, population estimates for 3 (4) year-old children in 2010, middle of the year, was 69,088 (71,164), while the number of 3 (4) year-old children in kindergarten in the same year was 25,525 (30,178).

16 ISCED 0 and ISCED 1 refer to some form of education, employing staff with specialised qualifications in education, and designed to meet the educational and development needs of children of at least 3 years of age.

2.6 Chapter Summary

Coverage of children with PE is generally low in Serbia, given the European benchmarks — it grows with age from 20% in crèche to 47–48% for 3 to 5.5 years old, and around 95% in compulsory PPP programmes. The enrolment of children from vulnerable groups is much lower and requires special attention. Survey data are revealing that preschool education covers only 29% of rural, 22% of poor and only 8% of Roma children, leaving those who need it the most not covered. Coverage is further characterised by high territorial differences that cluster municipalities into 4 groups depending on above/below average enrolment rates and above/below average children per group ratio. Municipalities with the highest coverage of children with PE are located in Belgrade and Vojvodina. On the other hand, two thirds of municipalities with very low enrolment rates fall into a group of the most under-developed municipalities. Level of under-development of municipalities shows correlation with enrolment rates across all municipalities in Serbia. Children are enrolled in three types of programmes depending on their daily duration. The majority of children attend full-day programmes as opposed to half day and 3-hour programmes. When comparing coverage by PE in Serbia in the past years to the situation in the EU countries, it is evident that enrolment of children from 3 to 5.5 years is much lower. Enrolment of 3 and 4 years old in 2005/06 in EU 27 was 74% and 87% respectively. In Serbia, in 2010/2011, only 37% of 3 year old and 42% of 4 year old were enrolled to preschool education programmes. Although enrolment trends in Serbia show an increase, it seems to be a consequence of demographic changes and negative population trends and if Serbia wants to reach its own targets, policy intervention must be introduced to expand the PE coverage.

3. THE REASONS FOR LOW COVERAGE OF CHILDREN IN PRESCHOOL EDUCATION IN SERBIA

Before we go into options on how to increase PE coverage, we need to look into reasons of its low rates. This Chapter discusses the reasons for low coverage of children by the preschool education in Serbia, particularly in the age group from 3 to 5.5 years, from the perspective of available physical and human resources, as well as perceived notion of a large number of parents in Serbia that preschool attendance is not beneficial to the development of their children at this stage.

3.1 Available Physical Resource Capacities in Preschool Education

The study of Ivić, Pešikan, and Jankov (2010) shows that available public preschool capacities are not sufficient to cover the total number of children left out from the preschool education in Serbia. For example, although the number of preschool buildings has increased every year in the last 20 years, it is not sufficient to cover all remaining children who are in need of preschool education. Further, preschool institutions are unevenly geographically distributed, such that the preschool institutions are absent in places where there the highest need for stimulation of children's early development (i.e., in underdeveloped, low-income, and rural areas). There is also number of settlements without preschool institutions and they are mainly located in Central Serbia.

To illustrate the capacity problem with the most recent available data, Table 4 and Figure 13 show a number of children in the preschool age (up to 7 years) not accepted due to lack of capacity, a number of children accepted over capacity, and a shortage of places in public preschool institutions in Serbia and Belgrade, separately, and in the period from 2008/2009 to 2011/2012. For example, in relation to the total number of children in preschool education in this age category (179,865, see Table 1), about 7% of children were not accepted due to the lack of capacity or were accepted over capacity in public preschool institutions in 2010/2011.

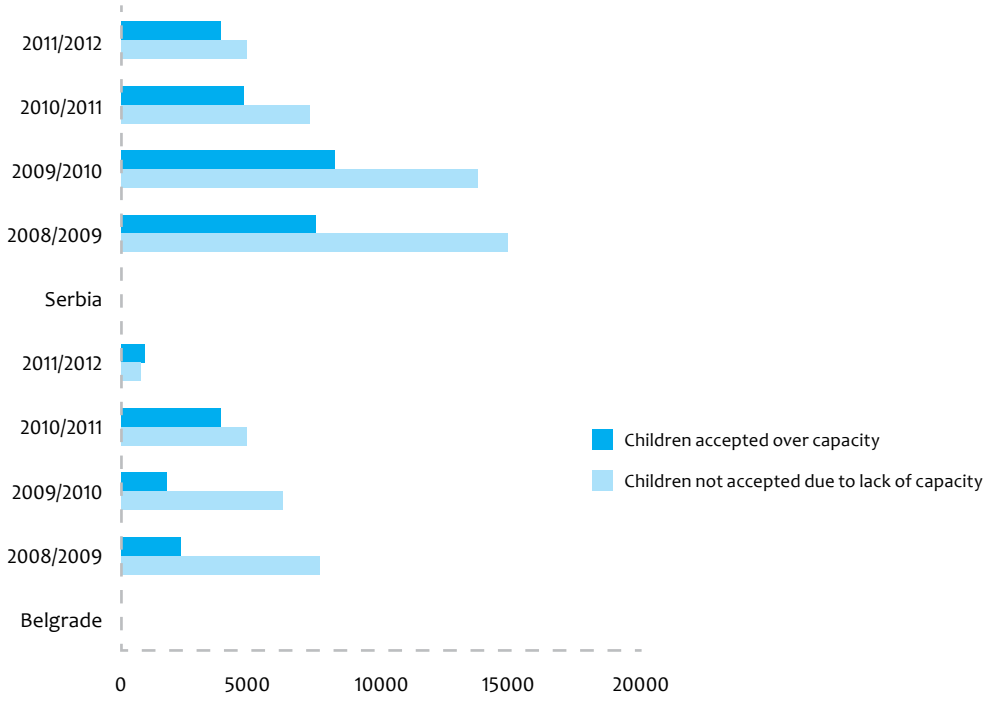
According to the RSO official, in the last few years there were new preschool objects built in municipalities in Belgrade, such as Zvezdara, Čukarica, Novi Beograd, Palilula, Zemun and Grocka, such that preschool capacities increased, resulting in a reduction in the number of children not accepted due to lack of capacity and a number of children accepted over capacity. At the same time, population size of these age cohorts shrank (see Figure 17). In a situation where we have an increase in preschool educational capacities and a reduction in the number of children in the age group up to 7 years, the number of children not accepted due to lack of capacity and a number of children accepted over capacity went down. This trend is evident across Serbia as a whole and Belgrade separately over the four observed years (from 2008/2009 to 2011/2012).

Table 4. **Number of children not accepted due to the lack of capacity, accepted over capacity, and the shortage of places**

	Number of children not accepted due to lack of capacity	Number of children accepted over capacity	Shortage of places
Serbia			
2008/2009	14,860	7,463	22,323
2009/2010	13,791	8,346	22,137
2010/2011	7,228	4,852	12,080
2011/2012	4,901	3,881	8,782
Belgrade			
2008/2009	7,707	2,325	10,032
2009/2010	6,243	1,794	8,037
2010/2011	2,086	842	2,928
2011/2012	843	914	1,757

Source: RSO data

Figure 13. **Number of children not accepted due to the lack of capacity, accepted over capacity, and the shortage of places**



Source: RSO data. Authors' calculations.

Although the Law on Preschool Education defines norms for the number of children in each age group (see Appendix A.2), in case of 3 and 4 year-old children (in focus of this report), these norms have often been exceeded. For example, Table 28 in Appendix A.2 shows that the norm for a number of children from 3 to 4 years (from 4 to 5 years) is 20 (22) children per group. However, in 2010/2011 in each age cohort, the number of children per group was exceeded by approximately 5 (4) children per group, to 25 and 26 children, respectively.

The study of Ivić, Pešikan, and Jankov (2010) therefore concludes that the construction and development of an improved preschool institution network is necessary. However, construction of new preschool objects should follow some previously set criteria, and there is a need for diversified preschool educational services. The Ministry of Education of the Republic of Serbia (MoE) has adopted a strategic document, which regulates criteria related to setting up a network of preschool and primary school institutions (Government of the Republic of Serbia (2010), "Regulation on the criteria for the adoption of act on the network of preschools and act on a network of primary schools"). On the base of this decision, which represents the nationally adopted criteria, local self-Governments should adopt their decisions on the local network of preschool institutions. These networks should be designed on the basis of situation analysis and the Improvement of Preschool Education Project in Serbia (IMPRES) project is helping them in this task. Criteria for opening a new preschool building should primarily be based not on custodial function of preschool institutions but on child development, taking into account local geographic, economics, and cultural characteristics. According to Ivić, Pešikan, and Jankov (2010), adoption of these criteria would be a good base for provision of sufficient and more equal access to preschool education services.

Public Preschool Institutions: Some Numbers

In each municipality in Serbia there is only one public preschool institution which covers several preschool buildings, and in each building there could be several preschool groups. Table 5 presents information on the number of preschool institutions, buildings, groups and children in school year 2010/2011. According to the DD20 RSO (MoE) data, there were in total 179,865 (183,501) children in 8,791 (8,519) groups, in 2,384 (171) public preschool education buildings (institutions).[17] Out of the total number of groups, according to the DD20 RSO data, children up to 3 years were in 1,713 groups, while children older than 3 years were in 7,078 groups.

Table 5. Number of children, groups, buildings and public preschool institutions in Serbia in 2010/2011

	Number of children	Number of groups			Number of buildings	Number of institutions
		Total	Children up to 3 years	Children older than 3 years		
RSO data	179,865	8,791	1,713	7,078	2,384	
MoE data	183,501	8,519		6,828		171

Source: Analysis of preschool education, MoE, 2010, and DD20, number 100, RSO, 2010/11

17 The MoE figures do not include the groups of children in preschool education which take place in schools.

Private Preschool Institutions: Some Numbers

Educational institutions have equal status regardless of the form of the ownership and type of the founder. However, the number of private institutions which are registered as preschool institutions is still very low. For example, in 2010/2011 school year in Serbia there were 47 privately registered preschool institutions with 131 children's groups in total.[18]

Table 6 shows the data from the Ministry of Education on the number of children in preschool education in 2010/11 per type of ownership. According to the MoE, out of the total number of children from six months to 7 years enrolled in the preschool education programmes in 2010/2011 (190,616), less than 1% of children (1,637 children) were enrolled in private preschool institutions. Remaining 99% of children attended public preschool institutions located in preschool objects (96%) and public preschool institutions which are located in schools (3%). The latter are in most cases children enrolled into the PPP.

Table 6. **Type of ownership in preschool education in 2010/2011**

		No. of children	Structure in %
Public preschool educational programmes	Which take place in preschool institutions	183,501	96.3
	Which take place in schools	5,478	2.87
Private preschool education		1,637	0.86
All		190,616	100

Source: Ministry of Education, Analysis of preschool education, 2011

3.2 Available Human Resource Capacities in Preschool Education

Preschool education employed total of 22,501 people in school year 2010/2011, including 11,589 kindergarten educators, 3,495 health care workers and 401 research assistants (RSO, DD20, 2010/2011). Table 7 shows that according to MoE (Analysis of preschool education, 2011) and RSO data, in 2010/2011 the number of children per group in public preschool institutions, for children from six months to 7 years, was on average 21, while the number of children per educator in the same age group was on average 12.

Table 7. **Average number of children per group and educator in 2010/2011**

	No. of children per group	No. of children per educator
MoE data for children 0.5 to 7 years	21,5	12.4
RSO data for children 0.5 to 7 years	20.5	11.9
RSO data for children 3 to 7 years	21.5	13.1

Notes: Source: MoE and RSO data

18 In some cases, PE services in private sector are also offered by institutions which are not registered as PE institutions, such as play rooms ("igraonice"), NGOs, etc. However, there are no available data on the number of these alternative private PE institutions.

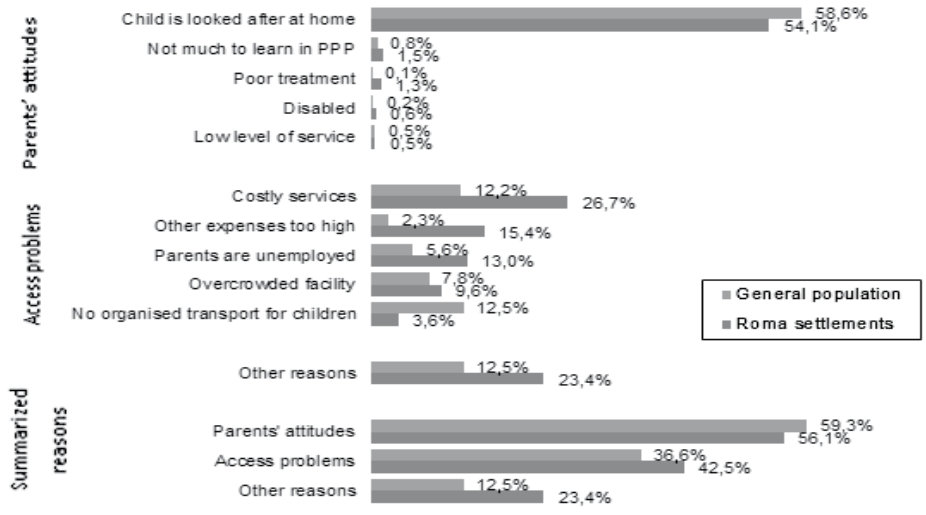
According to the study by Ivić, Pešikan and Jankov (2010), qualification structure of the teaching staff was good. That is, 96% of educators are qualified under the national standards, which implies tertiary education (International Standard Classification of Education (ISCED) level 5A), similar to the situation in the largest number of European countries (Teaching staff in pre-primary and primary education, EFA 2008).

3.3 Reasons for Preschool Non-Attendance According to the MICS4 Survey

This Section discusses the reasons for the non-attendance of children in preschool education in Serbia, using information from the MICS4 (2011) data, where parents of children from 3 to 5 years who did not attend kindergarten were asked for reasons of non-attendance. MICS4 (2011) data show that one of the main reasons for low preschool coverage of children from 3 to 5 years in Serbia was parents' opinion that their child receives adequate care at home, so there is no need for kindergarten. This opinion was shared by 59% of parents in the general population (54% among Roma) with significant variation among different wealth groups. While almost 80% of the parents from the richest households give this as the main reason for non-attendance, it is the case for only 46% of parents from the poorest households. Problems in access to PE present equally important reason for non-attendance for the poorest, Roma and people living in rural areas. High costs of services and other costs associated with PE attendance were an obstacle for almost one third of parents among the poorest in the general population and for more than 40% of Roma parents. Lack of organized transportation was recognised as an obstacle by 20% of parents living in rural areas. If all access categories are summed up, they present an obstacle for 44% of parents from the poorest households.

Comparison of general and population from Roma settlements in terms of reason for kindergarten non-attendance according to the MICS4 data is presented in Figure 14.

Figure 14. **Reasons for preschool non-attendance, children from 3 to 4 years — Comparison of general and population from Roma settlements, multiple answers**



Source: MICS, UNICEF (2011). Multiple answers mean that respondent could give more then one response, hence the percentages of respondents who gave different answers do not sum up to 100%.

It can be concluded that increase in PE enrolment cannot only be solved from the supply perspective (increase in physical PE capacities). There is evidently low demand for PE services, caused by insufficient recognition of the importance of the PE not only from custodial, but also from developmental perspectives. If total number of children in age group 3–5.5 years (177.740) is reduced by the number of children who do not demand PE services (52.239), we are left with 125.411 children who demand preschool education. If solving access and capacity problems of PE in Serbia would enable that all these children are enrolled into preschool education, the full coverage would reach 70.6%.[19] Without systematic effort directed at increasing parents' awareness about benefits and importance of PE for development of their children, under the current parental 'frame of mind' and attitudes toward PE, maximum reachable PE coverage of children in age group 3–5.5 years is around 70%.

3.4 Comparison with the EU Countries

In terms of available human resources in preschool education, according to the publication on "Teaching staff in pre-primary and primary education" (EFA, 2008), qualification structure of the teaching staff in Serbia is similar to the situation in the largest number of European countries. In terms of average number of children per educator, we cannot make a direct comparison between Serbia and other EU/developed countries because the RSO calculates the number of educators regardless of their full-time or part-time engagement, whereas in the developed economies the number of educators indicates the full-time equivalents (FTEs). Therefore, we cannot conclude that the average number of children per educator of 12 in Serbia in 2010/2011 ranks better than the average number of children per educator in USA (equal to 14 and ranked on the 15th place out 28 countries for which data on preschool education were available in 2009) or France (equal to 19 and ranked on the 26th place out of 28 countries in 2009) (PISA in Focus, 2011).

3.5 Chapter Summary

This Chapter discussed the reasons for low coverage of children by the preschool education in Serbia, particularly in the age group from 3 to 5.5 years. First, available public preschool capacities, that accommodate 99% of enrolled children, are not sufficient to cover the total number of children left out from the preschool education in Serbia. The network of preschool institutions is not evenly geographically distributed with frequently preschool institutions being absent where there is the highest need (in under-developed and rural areas). New buildings were built every year, especially in municipalities in Belgrade. Those capital investments with negative demographic trends considerably decreased percentage of children not accepted due to lack of capacity or those accepted over capacity, but their number still reaches 7%. Although, on average, Serbia has optimal number of children per PE group, number of children in age groups of 3 and 4 years exceeds norm of 20 (22) children per group and reaches 25 among 3 year-olds and 26 in groups of 4 year-old children.

19 Using simple arithmetic calculation based on numbers in Figure 14, out of all children who do not attend PE, for 56% of them (average of the general and Roma populations of the answer "child is looked after at home") there is no demand for preschool education services. Out of all children in age group 3–5.5 years (177.740 in 2010/2011, see Table 12), number of children left out of preschool in 2010/2011 was 93.445; 56% of this number is 52.329.

Lack of physical capacity is one important aspect of low coverage but there are other equally important ones. Information from the MICS4 (UNICEF, 2011) data, where parents of children from 3 to 5 years who did not attend kindergarten were asked for reasons of non-attendance, show that 59% of parents think that there is no need to send children to PE as there is someone at home to take care of them. They primarily see PE through its custodial function and do not see other benefits of preschool attendance for development of their children at this stage. Different characteristics related to access to PE (e.g., cost of services and other associated costs, transport, etc.) present obstacle for preschool attendance for 30–44% of the poor, Roma and children from rural areas. These findings show that expansion of PE coverage will require undivided attention on two fronts. First, increase in physical PE capacities is needed and it is encouraging that new legislation gives directions for better planning of the network of PE institutions and sets criteria for opening of new PE institutions based on child development function of PE. Second, there is a need to increase parents' awareness on benefits and importance of PE for development of their children.

4. CURRENT LEVELS OF PUBLIC EXPENDITURES FOR PE AND UNIT COSTS

The Chapter gives a presentation of the current levels of public expenditures for preschool education and continues with calculation of unit costs. Unit cost per child is calculated in terms of recurrent costs, for different preschool educational programmes (full- and part-time), using the Treasury data and taking into account different categories of preschool expenditures.

4.1 Current Levels of Public Expenditures

The public spending on education in Serbia in 2005 by level of Government (Republic and Local) and in relation to both total public expenditures and GDP is presented in Table 8 (Levitas and Herczynski, 2006). It can be seen from the Table 8 that public expenditure on education in Serbia equalled 4.53% of GDP and 11% of all public expenditures in 2005. According to Levitas and Herczynski (2006), "education spending in Serbia measured both as percentage of GDP (4.53%) and as a share of total public expenditure (11.0%) are significantly below their respective means for OECD countries — 5.4 percent of GDP and 12.9 percent of public expenditure in 2002. This suggests that whatever inefficiencies there are in the Serbian educational system, (…) efforts to correct them should not be accompanied by a decrease in education expenditure. On the contrary, while the Serbian education system needs to make better use of existing resources, it could also reasonably benefit from additional resources." Further, the local Governments account for almost 20% of all public expenditures on education, equal to 0.90% of GDP (15% for primary schools, 14–20% for secondary schools, and 100% for preschools). According to Levitas and Herczynski (2006), this means that local Governments spend a higher share of their total expenditures on education (14.2%) than the national Government (10.4%).

Expenditures on preschool education were 0.43% out of 4.53% expenditures on education. This is lower than average preschool expenditures across OECD countries, which was 0.5% of GDP in 2004, similar to the EU-19 countries which are also members of the OECD (Pešikan and Ivić, 2009).

Table 8. **Education Spending by Level of Government in 2005 as % of GDP (in 000 dinars)**

2005 GDP = 1,628,500,000	Republic	Local	Total
Public Education Expenditures	59,172,961	14,595,068	73,768,029
Total Public expenditures	566,267,000	102,974,000	669,241,000
Education as % of Total Public Expenditures	10.4%	14.2%	11.0%
Education as % of GDP	3.63%	0.90%	4.53%

Source: Levitas and Herczynski (2006).

A relative share of preschool expenditures to the total education expenditures was 9.3% (=0.43/4.53*100) which is higher than the average across OECD countries (7.9%). The reason

probably lies in the fact that primary education in Serbia begins later (between ages 6 and 7) than in most OECD countries. Since children participation in preschool education in Serbia is one of the lowest in Europe, the authors conclude that the money used for this purpose is not used efficiently enough.

4.2 The Unit Costs of the Current Preschool Education Programmes

Expenses on Preschool Education from the Treasury

According to the paper by Myers (2008), costs of preschool programmes can be estimated in three ways: from official budgets and expenditure records, from the resources actually used, and by putting together cost simulation models. Further, literature on costing of preschool education programmes uses different expenditure categorizations. For example, paper by Myers (2008) uses an 11-item categorization: personnel costs, infrastructure, materials, supplies, food, overhead expenses, transportation, uniforms, training, development, and evaluation costs. The paper by Van Ravens (2010) — VR (2010) henceforth — uses the following categorization of preschool expenses: teacher salary, training and supervision, utilities, material expenses, food, nutrients, medical supply, transport, and initial investment.

In order to estimate the costs of different preschool programmes offered in Serbia, we have obtained the data from the Treasury at the municipality level in the period from 2005–2009.[20] We have used in the analysis period from 2007 to 2009 because of comparability with other data sources (i.e., demographic statistics, and preschool education coverage at the municipality level).[21] This report takes into account all Serbian municipalities (136 out of 147 municipalities in total) for which data from all sources (from Treasury and/or other sources) for the three analysed years (2007–2009) are available. This makes the working sample of 408 observations (136 municipalities over 3 years).

Preschool expenditures data from the Treasury show how the money is actually spent. However, these data only show funds received from the budgets of local Governments and "do not account for resources received in other ways including locally-obtained funds, donations of time and in-kind contributions," (Myers, 2008). Further, capital expenditures in one year should be spread over a number of years and it is difficult to assess how reliable these records actually are. Nevertheless, in the absence of information on actual preschool expenditures in all municipalities in Serbia, we have used information from the Treasury in our costing exercise.

Next to the Treasury data which recorded preschool expenditures categories at the municipality level in the period from 2007–2009, we have also collected own data from a sample of municipalities (see Appendix) on actual preschool expenses in 2011. We have used this information in order to check our calculations based on the data from the Treasury, make necessary corrections, and provide calibration of costs not available from the Treasury data.

20 We would like to thank Predrag Lažetić from the Centre for Education Policy in Belgrade for kindly helping us to get access to the Treasury data.

21 Ideally, we would have liked to use the most recent data from the Treasury (i.e., year 2010 or later), but these data were not readily available. Further, since some municipalities do not show up in the Treasury records in all analysed categories/years, pooling the data over three most recent years ensured better data reliability than if we have just focussed on one year (e.g., 2009).

Calculating Total Costs of Preschool Education (TCPE)

Utilising the data from the Treasury, it is possible to indirectly arrive at approximate actual total costs per types of preschool, considering that children before age of 3 attend the crèche, children between ages 3 and 5.5 years attend the kindergarten, and children between ages 5.5 and 6.5 years attend the PPP. Taking into account that in case of Serbia budgets of local Governments cover 80% of the total preschool expenses and parents contribute additional 20%, total costs of preschool education (TCPE) are calculated as the preschool expenditures from the Treasury, increased by parents' contribution (we have assumed that parents' contribution is earmarked for food and nutrition). This division of expenses across local Governments and parents has also been confirmed by own survey data and is in line with the legal and normative framework (see Section 1.2). The total costs of preschool education (TCPE) are then calculated as follows:

TCPE (100%) = Treasury (80%) + Parents' contribution (20%)

Average total actual preschool expenditures from the Treasury, increased by the parents' contribution, are presented in column (2) in Table 9.[22] In the period from 2007 to 2009, average total actual PE expenditures on all types of preschool were about 16 and a half billion dinars (about 173 million EUR). If we only take into account the data from the Treasury, we get that average preschool expenditures on all types of preschool over the three analysed years were about 13.3 billion dinars (139 million EUR). According to Levitas and Herczynski (2006), preschool expenditures in Serbia represented 0.43% of the Gross Domestic Product (GDP) in 2005. Assuming the same percentage across 2007–2009 years and averaging GDP over the three years to 30 billion EUR, 0.43% of GDP amounts to 130 million EUR, which is close to the amount of 139 million EUR which we estimated below.

Table 9. **Average actual total costs of PE in Serbia, in the period from 2007 to 2009 (in RSD and EUR)**

Expenditures	Treasury	Treasury + Parents
Total (RSD)	13,301,980,000	16,627,470,000
Total (EUR)	138,582,900	173,228,700

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

When it comes to a breakdown of preschool education expenditures into particular expense categories, such as personnel costs, infrastructure, materials, supplies, food, overhead expenses, transportation, uniforms, training, development, and evaluation costs (Myers, 2008) or teacher salary, training and supervision, utilities, material expenses, food, nutrients, medical supply, transport, and initial investment (Van Ravens, 2010), most of these expense categories are collected in the data from the Treasury. However, the Treasury does not collect information on initial training

22 We deflate preschool expenditures from the Treasury using the Consumer Price Index (CPI) provided by the Republic Statistical Office (RSO), with base period being December 2009. Deflated amounts in RSD are transformed into EUR using the National Bank of Serbia (NBS) average exchange rate in the period from 1st to 31st December 2009 (working and non-working days), whereby 1 RSD = 0.01041822 EUR.

and education of teachers. Further, expenditure data from the Treasury (category duguje) does not account for resources received from parents, donations of time and in-kind contributions. There is also no item for food and nutrition. From the perspective of this report, one of the biggest drawbacks of the Treasury data is that it does not illustrate expenses per type of preschool (eg, crèche, kindergarten, and PPP); it only shows overall expenses for preschool education in Serbia per certain expense category.

Table 10 presents broad categories of expenses from the Treasury, as recorded under the function 911 (preschool). For a more detailed breakdown of preschool expenses from the Treasury, see Appendix A.7 (in Serbian only). The largest component in the Treasury categorization are expenditures for employees (18%) and expenditures for employees coming from the budget (65%), constituting 83% of the total preschool expenditures.

Table 10. **Broad categories of preschool expenditures from the Treasury, as recorded under the function 911 (preschool)**

Category (English)	Category (Serbian)	Variable label (Stata)
Expenses for employees	Rashodi za zaposlene	**rzaposl**
Use of goods and services	Koriscenje usluga i roba	koruslrob
Travel expenses	Troskovi putovanja	trosput
Contracted services	Usluge po ugovoru	uslugegovor
Specialized services	Specijalizovane usluge	uslugespec
Ongoing repairs and maintenance	Tekuce popravke i odrzavanje	poprodrz
Material	Materijal	materijal
Borrowing fees	Takse koje proisticu iz zaduzivanja	taksezaduz
Current and capital subsidies	Tekuce i kapitalne subvencije	subvencije
Transfers to other levels of Government	Transferi ostalim nivoima vlasti	transferi
Expenses for social protection (budget)	Naknade za socijalnu zastitu iz budzeta	naknade
Donations to other nonprofit institutions	Donacije ostalim neprofitnim institucijama	donacije
Taxes, and obligatory fees and penalties	Porezi, obavezne takse i kazne	portakskazn
Current expenditures (budget)	Tekuci rashodi (iz budzeta)	tekrashbudz; **rzaposlbudz**
Fixed assets, stocks (inventories and materials) and natural assets	Osnovna sredstva, zalihe (i zalihe materijala) i prirodna imovina	osnsred
Repayment of capital, the acquisition of financial assets, intangible assets and loans	Otplata glavnice, nabavka finansijske imovine, nematerijalna imovina i krediti	finimov
Reserves	Sredstva rezerve	rezerva
Buildings and building structures	Zgrade i gradjevinski objekti	zgrade
Machinery and equipment	Masine i oprema	oprema

Source: Treasury and authors' calculations.

Based on the data collected from the 10 sampled municipalities, we come to the following breakdown of major preschool expenditure components for children from 3 to 5.5 years attending full-day kindergarten: employees' salaries and contributions constitute 65%, food and nutrition 12%, and other current expenditures constitute 19% of the total preschool expenses for the targeted group of children (from 3 to 5.5 years).

Calculating Unit Costs of Preschool Education (UCPE)

In order to calculate *unit costs* per child in preschool education using available information from the Treasury and accounting for parent's contribution for food and nutrition, we have re-calculated all children in preschool education over the analysed years as children in preschool education in a 3-hour programme. In the absence of the actual distribution of the expenditures from the Treasury per type of preschool (eg, crèche, kindergarten, and PPP), we have made the following assumptions:

- Attending full-day PE education programme (crèshe or KG) costs three times more than attending three-hour PE education programme.

- Attending full-day PE education programme (PPP) costs two times more than attending three-hour PE education programme, since part of the expenditures for the PPP are covered from the national budgets and are not accounted for in the Treasury data.

- Attending half-day PE education programme (KG) costs two times more than attending three-hour PE education programme.

Since the final outcomes of the cost estimations in this report are very sensitive to these assumptions, we have compared them with a small number of available observations from other countries with similar pre-school systems. In Kyrgyzstan, the costs of half-day programmes without facilities for sleeping and meals were found to be 3.6 times lower than those of full-day programmes while in Poland that same ratio was similar, at 3.75 (Van Ravens, 2010). Much bigger was the difference in Armenia and Macedonia where the ratio was 6.32 and 6.43 respectively (ibidem). Our assumption that the unit cost of the three-hour programme (without sleeping and meals) is three times lower than that of the full-day program comes close to the situation in Kyrgyzstan and Poland, but is quite different from that in Armenia and Macedonia. Several hypotheses can be formulated to explain these bigger differences. Full-day programmes could be exceptionally costly in Armenia and Macedonia, but as Chapter 6 will show, this is also the case for Serbia. Another explanation could be that the unit costs of the short programmes in Armenia and Macedonia are exceptionally low as a result of a relatively large group size or the application of a multi-shift system (which is indeed the case in Macedonia). Whatever the cause of the international variation regarding the unit cost differences between short and full-day programmes, it seems fair to consider the ratio of three as the minimum and to keep an open eye for the possibility that the unit cost of the three-hour programme in Serbia is in reality lower — and possibly much lower — than what we calculate below.

The calculation then looks as follows:

1 child in full-day programme (crèshe) = 3*1 child in three-hour programme

1 child in full-day programme (KG) = 3*1 child in three-hour programme

1 child in full-day programme (PPP) = 2*1 child in three-hour programme

1 child in half-day programme (KG) = 2*1 child in three-hour programme

This calculation took into account that the full-time programme is longer than 8 hours a day (say 9 to 10 hours), a part-time program is 4 to 8 hours a day (say 4 to 5 hours), and a programme which is shorter than 4 hours a day can be approximately treated as a three-hour programme. Further, it is only possible to attend crèche as a full-day programme and the PPP as a full-day or a half-day programme. Preschool year is treated as 12 months for crèche and kindergarten and 9 months for the PPP. Before calculating the unit costs, children attending only half-day PPP are subtracted from the total number of children attending preschool, because expenditures for the half-day PPP (4 hours) are covered from the national budgets and are not accounted for in the Treasury data. For children who are staying in PPP full-day, we assumed that cost of 4 hours is covered by the national budget while local budgets still cover other 4–5 hours and their consequent costs (food, share for facility maintenance, teachers' salaries for that other half day, etc.).

Dividing the total preschool expenditures paid by the local Governments and parents by this "new" number of children in preschool education, we are able to calculate the recurrent actual costs per child per municipality per year or unit cost (2007–2009), assuming that a child attends the three-hour preschool programme. Resulting unit costs calculations are presented in Table 11.

Table 11. **Unit costs of PE per child per year by type of preschool programme; in DIN (top panel) and in EUR (bottom panel)**

Type of preschool	Government	Parents	Total
In RSD			
3 hours (4 hours or less)	37,584	9,396	46,980
Half day (4–8 hours)	75,169	18,792	93,961
Full day (8 hours or more)	112,753	28,188	140,941
In EUR			
3 hours (4 hours or less)	392	98	489
Half day (4–8 hours)	783	196	979
Full day (8 hours or more)	1,175	294	1,468

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

The yearly unit costs of a 3-hour, a half-day, and a full-day programme are 47,000; 94,000; and 141,000 dinars respectively (about 500; 1,000; and 1,500 EUR respectively). Considering that preschool facilities are available for 12 months in a year for crèche and kindergarten, the monthly unit costs of a 3-hour, a half-day, and a full-day programme are 3,900; 7,800, and 12,000 dinars respectively (41, 82, and 122 EUR respectively). These numbers are in line with information collected through the sampled municipalities, taking into account first that numbers calculated based on the Treasury data cover years 2007 to 2009 and information collected through the survey questionnaire cover school years 2008/2009 to 2010/2011, and second, that the €500 per year estimated for the three-hour program is the maximum; it might be lower but it is unlikely to be higher.

4.3 Chapter Summary

Public expenditures for education in Serbia are below their respective means for OECD countries (4.53% of GDP and 11% of public expenditures in Serbia versus 5.4% and 12.9% in OECD countries) and would benefit from additional resources. Expenses are shared by the national and local budgets where local Governments account for almost 20% of all public expenditures on education and they spend higher share of their total expenditures on education (14.2%) than the national Government. Expenditures for preschool education were 0.43% out of 4.53% of GDP earmarked for education, which is again lower than in OECD countries (0.5%). Relative share of PE expenditures in total education expenditures was higher in Serbia than in OECD (9.3% versus 7.9%), which can be attributed to the later start of primary education in Serbia but also shows that this money is not used efficiently enough.

In order to calculate the unit cost of preschool education, data from the Treasury of the Ministry of Finance for 2007–2009, on funds spent for PE from municipal budgets, were used. Local Governments in Serbia were spending around 13,3 billion RSD (expressed in December 2009 RSD) or 139 million EUR (expressed in December 2009 EUR) annually on PE. When increased for 20% what is the value of parents' contributions, total expenditures reached amount of 16.6 billion dinars or around 173 million EUR. Since children attend programmes of different duration (full-day, half-day, or three-hour) that are not visible as such in budget expenditures from the Treasury, their stay in PE was recalculated through 3-hour units. When the total expenditures were divided per total number of 3-hour units, the unit cost of 3-hour programmes was obtained in the value of a maximum of about 500 EUR per year. The unit cost of the half-day program is about 1,000 EUR and the cost of full-day programme is about 1,500 EUR per year.

5. COSTS OF FULL COVERAGE OF CHILDREN 3–5.5 YEARS WITH DIFFERENT PRESCHOOL EDUCATION PROGRAMMES

As we have argued at the very beginning of this report, preschool education attendance has demonstrated positive effects on child development, especially for the most vulnerable children. Although the newest legislation in this area gives enrolment priority to children coming from socially vulnerable groups, it is not so in reality. In the Draft National Strategy of Education Development in Serbia until 2020, it is envisioned that children in the age group 4–5.5 years universally access preschool education. This should also provide higher chances of PE inclusion of those children who need it the most.

5.1 From Unit Costs to Total Costs of Universal Preschool Education

In order to calculate the total costs of different preschool education programmes for all children and children currently not in PE, we will use the following formula

$$Total\ costs = p * unit\ costs$$

where *p* is the number of children and *unit costs* are calculated in Table 11.

In Table 12, total cost for different policy options are presented (the full-day, half-day and 3-hour programmes). When the total costs for children out of preschool are estimated, the number of children (*p* value in the above formula) is equal to the number of children 3–5.5 years who did not attended preschool education in 2010/2011. Conversely, when the total costs for all children 3–5.5 years are estimated, the total number of children in this age group in 2010/2011 is used.

Table 12. **Total costs of the universal PE policy, for children 3–5.5 years**

Type of preschool	Applied formula	Total
Children 3–5.5 years out of preschool (in RSD)		
3 hours (4 hours or less)	93,445 children * 46,980 dinars	4,390,046,100
Half day (4–8 hours)	93,445 children * 93,961 dinars	8,780,185,600
Full day (8 hours or more)	93,445 children * 140,941 dinars	13,170,232,000
Children 3–5.5 years out of preschool (in EUR)		
3 hours (4 hours or less)	93,445 children * 489 Euros	45,694,605
Half day (4–8 hours)	93,445 children * 979 Euros	91,482,655
Full day (8 hours or more)	93,445 children * 1,468 Euros	137,177,260
All children 3–5.5 years (in EUR)		
3 hours (4 hours or less)	177,740 children * 489 Euros	86,914,860
Half day (4–8 hours)	177,740 children * 979 Euros	174,007,460
Full day (8 hours or more)	177,740 children * 1,468 Euros	260,922,320

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

Looking into what are the additional resources needed for universal coverage, we come to the following figures:

- For 4.4 billion RSD (46 million EUR) per year, Serbia can provide three-hour preschool programme to all children aged between 3–5.5 years currently not covered by the preschool education. Once again it should be noted that this is a maximum estimation; the costs may be lower, depending on the unit costs (see previous chapter).

- For nine billion RSD (91 million EUR) per year, Serbia can provide half-day preschool programme to all children aged between 3–5.5 years currently not covered by the preschool education.

- For thirteen billion RSD (137 million EUR) per year, Serbia can provide full-day preschool programme to all children aged between 3–5.5 years currently not covered by the preschool education.

These are significant sums of money. It should be noted that the above amounts include parents' contribution. This means that at least 80% of these costs should be provided directly from the local and national Governmental budgets. For three-hour, half-day, and full-day programmes this is 37, 73, and 110 million EUR, respectively.

Let us assume that the Government of Serbia would expand PE access gradually in order to cover all not-enrolled children, first to children in the age group 4 to 5.5 years and then to children in the age group 3 to 4 years. In 2010/2011, there were 53,531 children in the age group 4 to 5.5 years left out from PE and 39,914 children in the age group 3 to 4 years left out from preschool. If we apply the same total costs formula to these two age groups, we get the following picture about total expenses necessary in order to have *universal* PE access of children in these two age groups.

Table 13. **Total costs of the universal PE policy, for children 4–5.5 years**

Type of preschool	Applied formula	Total
In RSD		
3 hours (4 hours or less)	53,531 children * 46,980 dinars	2,514,886,400
Half day (4–8 hours)	53,531 children * 93,961 dinars	5,029,826,300
Full day (8 hours or more)	53,531 children * 140,941 dinars	7,544,712,700
In EUR		
3 hours (4 hours or less)	53,531 children * 489 Euros	26,176,659
Half day (4–8 hours)	53,531 children * 979 Euros	52,406,849
Full day (8 hours or more)	53,531 children * 1,468 Euros	78,583,508

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

Table 14. **Total costs of the universal PE policy, for children 3–4 years**

Type of preschool	Applied formula	Total
In RSD		
3 hours (4 hours or less)	39,914 children * 46,980 dinars	1,875,159,700
Half day (4–8 hours)	39,914 children * 93,961 dinars	3,750,359,400
Full day (8 hours or more)	39,914 children * 140,941 dinars	5,258,469,900
In EUR		
3 hours (4 hours or less)	39,914 children * 489 Euros	19,517,946
Half day (4–8 hours)	39,914 children * 979 Euros	39,075,806
Full day (8 hours or more)	39,914 children * 1,468 Euros	58,593,752

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

5.2 Costs of Universal Free-of-Charge Three-Hour PE Programmes

We could see from the previous calculations that expansion of the PE coverage with full-day programmes would present a considerable cost for the state. On the other hand, we have three-hour programmes that could provide significant support to child development (especially if it is of good quality) and are at the same time the cheapest PE programmes. This scenario will look into options on how to provide free-of-charge universal access to this type of preschool programmes for all children 3–5.5 years old.

Applying calculated unit costs, if all children of respective age would be enrolled into three-hour PE programmes, the total costs would be around 87 million EUR (see Table 15). As almost half of 177,740 children are already enrolled into some type of PE of duration of at least 3 hours, there are 93,445 children that remain to be enrolled. That would present a cost of around 46 million EUR in total.

Table 15. **Total costs of the universal PE access into three-hour programmes, for children 3–5.5 years**

3 hours (4 hours or less)	Applied formula	Total
In RSD		
Not in PE	93,445 children * 46,980 dinars	4,390,046,100
Currently in PE	84,295 children * 46,980 dinars	3,960,179,100
Total	177,740 children * 46,980 dinars	8,350,225,200
In EUR		
Not in PE	93,445 children * 489 Euros	45,694,605
Currently in PE	84,295 children * 489 Euros	41,220,255
Total	177,740 children * 489 Euros	86,914,860

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

In Chapter 2 we presented quite high differences in enrolment rates for different municipalities in Serbia, with the lowest levels of enrolment in municipalities that fall in the category of economically underdeveloped municipalities. This categorization of municipalities by level of development could be a basis for differentiated mechanisms of costs sharing. In order to calculate the percentage of children for whom costs of PE needs to be covered, taking into account percentage of children living in municipalities categorized according to the "level of development" in Serbia, we will use the distribution as in Table 16.

Table 16. **Distribution of 100 children between ages 3–5.5 years, taking into account percentage of children living in municipalities with different "level of development"**

Municipality by level of development	In KG	Not in KG	Total
Group 4	2.2	8.1	10.3
Group 3	4.5	10.7	15.2
Group 2	4.2	7.0	11.2
Group 1	36.6	26.7	63.3
Total	47.5	52.5	100

Source: The Law on Regional Development. DD20 RSO (2010) data. Authors' calculations.

Table 16 tells us that majority of children live in 40 municipalities/cities that fall in the Group 1, while 37% live in municipalities belonging to Groups 2, 3 and 4 according to the level of development. Given the significance of preschool education attendance for child's development, in order to achieve national targets for the PE coverage, we can argue that the national Government can at least participate in the cost sharing of the amount equal to the parents' contribution (20%) for children living in municipalities from the second, third, and fourth category of development.

Table 17. **Division of costs of universal free-of-charge three-hour programmes by the national and municipal Governments, taking into account percentage of children living in municipalities categorized according to the "level of development"**

Municipality by level of development	Number of children (% & abs.)	Costs of three-hour programme	National Government (20%)	Local Government (80%)	Total costs
In RSD					
Group 2, 3 & 4	36.7% (65,231)	46,980	612,910,480	2,451,641,920	3,064,552,400
Group 1	63.3% (112,509)	46,980	1,057,134,560	4,228,538,240	5,285,672,800
Total	100% (177,740)	46,980	1,670,045,040	6,680,180,160	8,350,225,200
In EUR					
Group 2, 3 & 4	36.7% (65,231)	489	6,379,592	25,518,367	31,897,959
Group 1	63.3% (112,509)	489	11,003,380	44,013,521	55,016,901
Total	100% (177,740)	489	17,382,972	69,531,888	86,914,860

Source: The Law on Regional Development. DD20 RSO (2010) data. Authors' calculations.

Such a distribution would require allocation of around 6.4 million EUR from the national budget that would be transferred to municipalities from the second, third and fourth category of development as a transfer per number of children enrolled. Local budgets in those municipalities would have to cover around 25.5 million EUR if all children are to be enrolled. Without any transfer from the national level, municipalities with the above average level of development (first group) would have to bear the full costs amounting to around 55 million EUR.

In order to calculate the funding gap, we need to take into account a number of children who are already enrolled into PE. Using the results from Table 16, we can calculate a number of children from underdeveloped municipalities (Groups 2, 3 and 4) and those from Group 1 (see Table 18).

Table 18. **Number of children 3–5.5 years by level of municipal development and PE enrolment**

Municipality by level of development	In KG (%)	Number	Not in KG (%)	Number	Total (%)	Number
Group 2, 3 & 4	10.9	19,374	25.8	45,857	36.7	65,231
Group 1	36.6	65,053	26.7	47,457	63.3	112,509
Total	47.5	84,427	52.5	93,314	100	177,740

Source: The Law on Regional Development. DD20 RSO (2010) data. Authors' calculations.

On the base of these numbers we can estimate that total costs for children who are currently not enrolled into PE in underdeveloped municipalities equals around 22.4 million EUR (see Table 19). With the national transfer of 6.4 million EUR for this group, this would come to 16 million EUR for municipal governments to pay. Developed municipalities would have to cover around 23 million EUR in order to enrol children currently not covered by PE and have universal enrolment of all children 3–5.5 years into three-hour PE programmes.

Table 19. **Total costs of three-hour programmes for children 3–5.5 years, currently not in PE, per level of municipal development**

Municipality by level of development	Number	Unit costs of 3-hour programme (EUR)	Total costs (EUR)
Group 2, 3 & 4 (not in KG)	45,857	489	22,424,073
Group 1 (not in KG)	47,457	489	23,206,473
Total	93,314	489	45,630,546

Source: The Law on Regional Development. DD20 RSO (2010) data. Authors' calculations.

Since a contribution from the national budget of 20% might look modest, we developed another two scenarios under which:

- National budget covers 20% for all children in three-hour PE programmes: this means that the budget of the Republic would have to allocate around 17.4 million EUR, which would lower the burden on municipal budgets.

- National budget covers 40% for all children in three-hour PE programmes in municipalities belonging to Groups 2, 3, and 4 according to the level of development: this means that the budget of the Republic would have to allocate around 13 million EUR, decreasing the municipal burden in these municipalities to around 19 million EUR.

5.3 Chapter Summary

With the calculated unit costs, different scenarios for expansion of preschool education and their costing were developed. The costs of universal coverage of all children currently out of PE ranges from a maximum of 46 million EUR for three-hour programmes to 137 million EUR for full-day programmes. The costs of enrolling all children into PE are from 87 million EUR for three-hour programmes to 261 million EUR for full-day programmes. Expansion of PE and enrolment of all children that are currently out of PE can be done gradually, first by focusing on children in the age group of 4–5.5 years and in the second phase on 3 year-old children. It would split the needed funds into two phases requiring investment of 26 million EUR for 3-hour programmes to 79 million EUR if all are enrolled into full-day programmes in the first phase. The second phase would require from 20 million EUR for 3-hour to 59 million EUR for full-day programmes.

Taking into account considerable difference in the costs of full-day and three-hour programmes and the fact that good quality three-hour programmes meet development needs of children, introduction of the universal, free-of charge three-hour programmes seems as an option that is feasible from the financial side and at the same time adequate from the child development perspective. Argument put forward here is that preschool education should be observed as a strategic interest of the state and not only responsibility of local Governments and this argument is a base for the proposal of cost-sharing between the local and the national budgets. Territorial differences in coverage and levels of municipal development are also used as criteria for differentiation of transfers from the national to the local level. Covering remaining children aged 3–5.5 years with the three-hour PE programmes would require a maximum of 46 million EUR. Given that 63% of children live in municipalities from the first category of development and 37% live in the other three groups, PE investments for the first group amount to 23 million EUR and 22 million EUR for the municipalities in the remaining 3 groups. If PE represents strategic national interest, national budget could participate in bearing the costs for the most underdeveloped municipalities in the amount of 20% or 40%, or could also participate in sharing the costs for all municipalities in the amount of 20%. Different scenarios require allocations from the national budget in the range from 6.4 to 13 million EUR under the first scenario and 17.4 million EUR under the second scenario, hereby decreasing the required amounts to be covered by the local governments.

6. FINANCING OF PRESCHOOL EDUCATION — POSSIBLE SCENARIOS FOR FUNDING OF THE EXTENDED COVERAGE

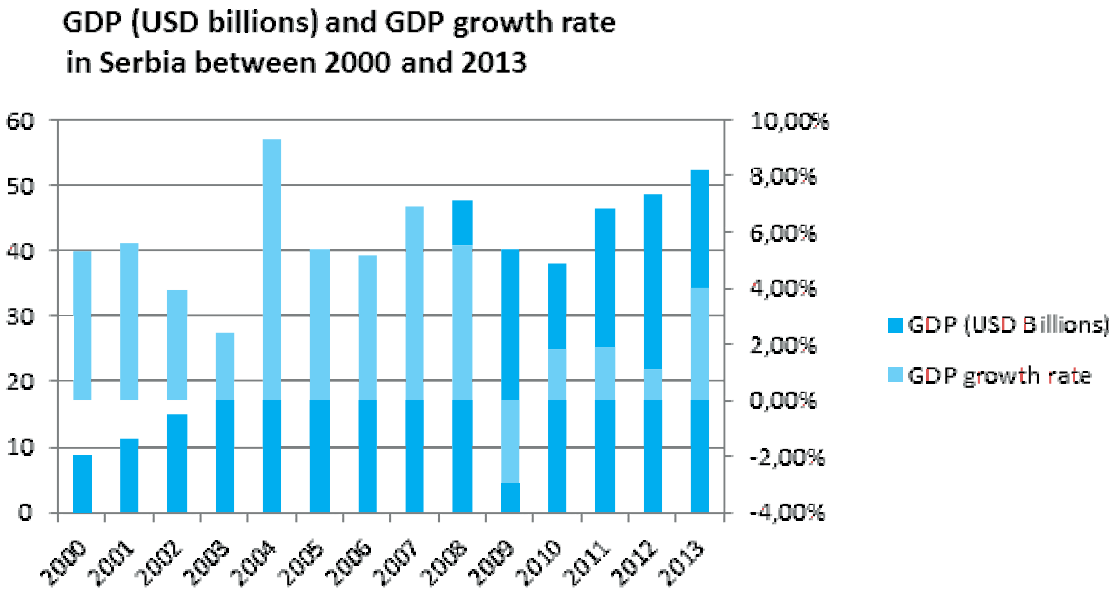
Scenarios for funding of the extended preschool education coverage include:

- Financing through gains from GDP growth
- Financing through development-tested user fees
- Financing through efficiency gains in existing KGs
- Raising fees for full-day PE programmes in KGs

6.1 Gains from Forecasted GDP Growth

Figure 15 shows a development of the Serbian GDP in billions USD (left axis, in blue) and the GDP growth rate (right axis, in red) in the period from 2000 to 2013. According to the IMF, Serbian GDP is on a recovery path, from a 3% decrease in 2009, to 1.8%, 1.9%, and 1.1% growth rate in 2010 and 2011, respectively. Currently, Serbian GDP grows at a rate of 0.5%, while projection for 2013 is that a growth rate of Serbian GDP will be 3% (Source: IMF country information for Serbia from April 2012).

Figure 15. **Development of Serbian GDP (level and growth rate)**



Source: IMF data (http://www.imf.org). Authors' calculations.

Taking this into account, Table 20 shows available resources for preschool education under the current 0.5% growth and projections of a 3% growth in 2013. Table also calculates available resources for preschool education under the status quo scenario (0.43% of GDP) and trying to reach the OECD average (0.50% of GDP).

Table 20. **GDP growth and available resources for preschool education under two scenarios**

	Status Quo		OECD averages	
Year	2012	2013	2012	2013
Serbian GDP (USD Billions)	48.50	52.50	48.50	52.50
Serbian GDP (EUR Billions), 1 USD = 0.7 EUR	33.95	36.75	33.95	36.75
Serbian GDP growth rate	0.50	3.00	0.50	3.00
Education as % of Total Public Expenditures	11.00	11.00	12.90	12.90
Education as % of GDP	4.53	4.53	5.40	5.40
Preschool expenditures as % of GDP	0.43	0.43	0.50	0.50
Preschool expenditures (EUR Billions)	0.15	0.19	0.18	0.22

Sources: IMF, Macroeconomic trends. Levitas and Herczynski (2006). Authors' calculations.

We see from Table 20 that under the status quo, preschool expenditures of 0.43 as percentage of GDP and 0.5% GDP growth rate, the Government can generate 150 million EUR for preschool education, whereas this number goes up to 190 million EUR with a GDP growth of 3% in 2013. Under the OECD scenario and preschool expenditures of 0.50 as percentage of GDP, the Government can generate 180 million EUR for preschool education under 0.5% GDP growth, whereas this number goes up to 220 million EUR with a projected GDP growth of 3% in 2013.

The total required costs for children aged 3–5.5 years currently not covered by KG and the total required PE costs for all children aged 3–5.5 (the total costs of the universal PE policy) are presented in Table 21.

Table 21. **Total costs of the universal PE policy, for children 3–5.5 years**

Type of preschool	Applied formula	Total
Children 3–5.5 years out of preschool (in EUR)		
3 hours (4 hours or less)	93,445 children * 489 Euros	45,694,605
Half day (4–8 hours)	93,445 children * 979 Euros	91,482,655
Full day (8 hours or more)	93,445 children * 1,468 Euros	137,177,260
All children 3–5.5 years (in EUR)		
3 hours (4 hours or less)	177,740 children * 489 Euros	86,914,860
Half day (4–8 hours)	177,740 children * 979 Euros	174,007,460
Full day (8 hours or more)	177,740 children * 1,468 Euros	260,922,320

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

This means that with 3% GDP growth in 2013 and 0.43% of GDP expenditures on preschool education (status quo), the Government could generate 190 million EUR earmarked for preschool education and could finance half-day preschool education programmes for all children aged 3–5.5 years in Serbia. With 3% GDP growth in 2013 and 0.5% of GDP expenditures on preschool education (OECD level), the Government could generate 220 million EUR earmarked for preschool education and could finance full-day preschool education programmes for all children aged 3–5.5 years in Serbia, with the a help of additional 40 million EUR to be generated, for example, from level of development-tested user fees, efficiency gains in existing KGs, and increasing the KG fees for children attending full-day preschool education. This is what we turn to next.

6.2 Level of Development-Tested User Fees

This section discusses the scenario of means-tested preschool education fees for parents who are unable to pay these fees or would suffer financial hardship by paying fees. In the current KG system, parents cover 20% of the full economic price of the KG. On the annual basis per type KG, this would be (in EUR):

Full-day:	20 * 137,177,260/100	= 27,435,452
Half-day:	20 * 91,482,655/100	= 18,296,531
Three hours:	20 * 45,694,605/100	= 9,138,921

This is already a substantial share. However, many parents cannot afford this fee, and for them the fee is waived. For example, the Government could transfer a vertical subsidy to the municipality for every child enrolled into preschool, and this per capita subsidy will be 98, 196, and 294 EUR per year higher for every child for whom the fee is waived, for three-hour, half-day and full-day KG programmes respectively.

The question is then what are the criteria for waiving or not waiving the fee. According to the collected survey data (see Appendix), current waiver criteria are based on family income, refugee status, a single-parent status, total number of children in the household who are already in some form of preschool education, a child's illness or special care, a child under guardianship ("pod starateljstvom"), etc. However, most surveyed municipalities (six of them) responded that there is no precise income scale on the base of which the waiver of preschool expenditures is determined. When further elaborated their answer, municipalities responded that parents coming from low socio-economic backgrounds must submit a waiver request to the municipality council, which is then evaluated and based on this decision, the total preschool expenditures are waived or not. Another problem is that parents employed in the private sector can hide their actual income and report it in such a way that they become eligible for KG waiver, while actual income in the public sector is much more transparent and not subject to strategic reporting by parents.[23] "This means that it is absolutely crucial to have a nationally agreed — and legally formulated — policy concerning fee reduction and fee waiving. Families should not have to wonder how much or whether they have to pay. There should be clear criteria and it should not differ from municipality to municipality," (Van Ravens, 2010). The fee waiving criteria should also be robust to any potential strategic behaviour of parents and/or local Governments.

23 Source: http://www.politika.rs/rubrike/Drustvo/Zasto-nema-jedinstvene-cene-vrtica.lt.html

There are different scenarios available in order to accommodate proposed fee policies, ranging from complex sliding scales with multiple fees for different income brackets, to a simple dichotomy whereby some pay the entire fee and others pay no fee at all. We will elaborate further the latter option, taking into account regional differences in the preschool enrolment across "level of development" of municipalities. In the absence of policy concerning fee reduction and fee waiving, we will use the scenario where we assume that parents living in municipalities in Group 3 and 4 have the fee waived — this is almost 20% of children. Therefore, 20 out of the 53 children who are in the target group for the half-day programme will have the wee waved, which is almost 40%. A second scenario is that the fee is also waived for children living in municipalities in Group 2 — this is almost 26% of children. A third scenario is that Government covers full costs of preschool education. This scenario makes a lot of sense, if we take into account that access to PPP, primary, and higher forms of education is completely free.

Table 22 calculates the total annual revenue from user fees under these three scenarios. It takes into account the percentage of children for whom the fee is waived, and then calculates the total revenues for three-hour, half-day and full-day KG programme (parents' contribution of 98, 196, and 294 EUR per year respectively).

Table 22. **Calculation of annual revenues from user fees, considering two scenarios**

	Fee waived	Fee paid	Target group	Fee payers	Revenue (EUR)
Scenario 1	40%	60%	93,445	56,067	
Full-day					16,483,698
Half-day					10,989,132
Three-hour					5,494,566
Scenario 2	50%	50%	93,445	46,723	
Full-day					13,736,562
Half-day					9,157,708
Three-hour					4,578,854
Scenario 3	100%	0%	93,445	0	
Full-day					0
Half-day					0
Three-hour					0

Source: Expenditures from the Treasury, weighted by the proportion of children in PE from DD20 RSO. Authors' calculation.

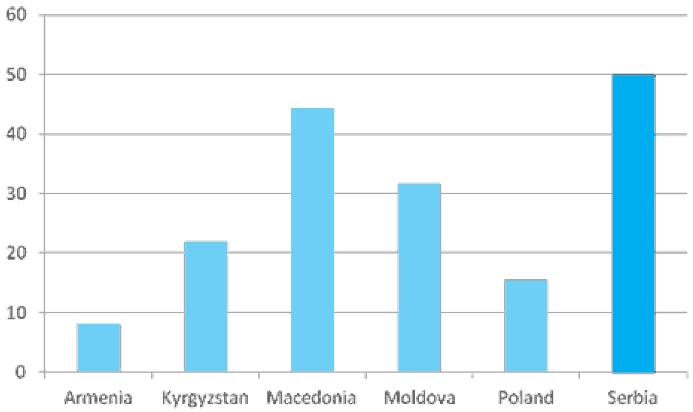
6.3 Efficiency Gains in Existing KGs

The second funding source is the scope for efficiency gains that can be made in the current preschool education system. For example, as we have concluded in Chapter 4 of this report, expenditures for preschool education were 0.43% out of 4.53% of GDP earmarked for education, which is lower than in OECD countries (0.5%). Relative share of PE expenditures in total education expenditures was higher in

Serbia than in OECD (9.3% versus 7.9%), which can be attributed to the later start of primary education in Serbia but also shows that this money is not used efficiently enough. Second source of inefficiency might be searched for from the perspective of the distribution of employees in preschool education: educators comprise 50% of all employees, health workers and other professional associates comprise 20%, whereas 'other' staff, such as kitchen personnel, security personnel, cleaners, janitors, etc., comprise 30% of all employees in preschool education.[24]

In his study, Van Ravens (2010) compares full-day unit costs as percentage of GDP per capita across five CEE/CIS countries and shows that these were about 8% in Armenia, 21% in Kyrgyzstan, 44% in Macedonia, 31% percent in Moldova, and 15% in Poland (see Figure 16). In case of Serbia, GDP per capita in 2010 was almost 3,000 EUR. This means that in Serbia, full-day unit costs as percentage of GDP per capita are about 50%. In comparison to the average across the five CEE/CIS countries of about 24% (without Macedonia, 19%), there is a potential to close the gap between Serbia and other CEE/CIS countries by about 25%.

Figure 16. **PE unit costs as a share of per capita GDP in selected countries**



Source: Authors' calculations for Serbia, and Van Ravens (2010) for the other countries.

Table 23 calculates the efficiency gains, which could only be done in a long term process, for three scenarios (50%, 40% and 30% full-day unit costs as percentage of GDP per capita), also including the 'no efficiency gains' scenario. It multiplies the three expenditure targets (50%, 40% and 30% of per capita GDP) with the budget[25] and divides the outcome by the present expenditure (50% of per capita GDP). This results in the "new budget" which is subtracted from the old budget in order to get efficiency gains.

24 These percentages do not reflect FTEs, but actual numbers of staff.

25 The budget refers to available governmental budget for KG in 2010, taking into account that approximately 3%, 34% and 63% of children in the age category 3–5.5 years is enrolled into three-hour, half-day and full-day KG programmes respectively (total number of children in the age category 3–5.5 years enrolled into KG is 84,295 in 2010). We multiply the number of children with 489 EUR, 979 EUR and 1,468 EUR for three-hour, half-day and full-day KG programmes respectively and then sum over all three categories in order to calculate a budget of 107,254,430 EUR in 2010 (expressed in December 2009 EUR).

Table 23. **Calculation of efficiency gains in KG, considering three scenarios**

Scenario	Target	Budget (EUR)	Factor	New budget	Eff. Gains (EUR)
High	30% GDP p/c	107,254,430	30/50	64,352,658	42,901,772
Medium	40% GDP p/c	107,254,430	40/50	85,803,544	21,450,886
Low	50% GDP p/c	107,254,430	50/50	107,254,430	0

Source: Expenditures from the Treasury. Authors' calculation.

6.4 Raising the Fees for Full Day-Care Programmes in KGs

Most of the children who are currently enrolled in KG are in the full-day programme. In Table 3 we see that out of all children from 3 to 5.5 years enrolled in preschool education, about 63% of them are in the full-day programmes. According to our survey data, this percentage is even higher (90%). According to own calculation of unit expenses (see Table 11), for a full day programme, parents pay less than 25 EUR per month on average across all municipalities in Serbia (or about 302 EUR per year).[26] In return they receive about 122 EUR worth of services per month. Hence, the subsidized part is almost 100 EUR per month or 1,200 EUR per year. This is higher than the half-day or three-hour unit costs per child per year of 979 EUR and 489 EUR respectively from which the poorer families would benefit if they would pay no fee. In comparison to the three-hour programme, this is more than double the unit costs per child per year.

Therefore, it would be possible to raise the part of the fee for full-day KG paid by parents in order to help finance the half-day or three-hour ECD programmes for children currently not covered by the KG. We consider three different scenarios in which the fee for full-day KG paid by parents is raised to 30 (5 EUR or 20% increase), 35 (10 EUR or 40% increase), and 40 EUR (15 EUR or 60% increase) per month, respectively. This would generate an extra of 60, 120 and 180 EUR per child per year, respectively. Table 24 calculates the gains under the three scenarios.

Table 24. **Calculation of gains resulting from raising the fee for full-day KG paid by parents**

Scenario	Monthly fee increase (EUR)	Monthly fee increase (%)	Enrolment in 2010	Gains per year (EUR)
High	15	60%	84,295	15,173,100
Middle	10	40%	84,295	10,115,400
Low	5	20%	84,295	5,057,700

Source: Authors' calculation.

26 The actual amount that parents pay for preschool substantially differ between municipalities in Serbia, from 2,200 din in Jagodina and Novi Sad, about 3,500 din in Leskovac to 12,500 din in Niš (Source: http://www.politika.rs/rubrike/Drustvo/Zasto-nema-jedinstvene-cene-vrtica.lt.html).

6.5 Cost-Sharing Scenarios

In order to estimate what is left to pay for the Government, Table 25 to Table 27 combine high, middle and low scenarios of (1) level of development-tested user fees; (2) efficiency gains in existing KGs; and (3) raising the fees for full-day programmes. Scenario 1 is always the highest and scenario 27 is always the lowest. Put differently, under scenario 1 the Government needs to generate least extra funds, while under scenario 27 contributions from level of development-tested user fees, efficiency gains in existing KGs, and KG fees are the lowest, hence the Government needs to generate most extra funds in order to close the gap between required and total amounts.

Table 25. **Cost-sharing scenarios (in million EUR): Full-day programme**

Scenario	User-fee	Efficiency	KG-fee	Total	Required	Government
1	17	43	15	75	141	–66
4	14	43	15	72	141	–69
2	17	43	10	70	141	–71
5	14	43	10	67	141	–74
3	17	43	5	65	141	–76
6	14	43	5	62	141	–79
7	0	43	15	58	141	–83
8	17	22	15	54	141	–87
9	0	43	10	53	141	–88
10	14	22	15	51	141	–90
11	17	22	10	49	141	–92
12	0	43	5	48	141	–93
13	14	22	10	46	141	–95
14	17	22	5	44	141	–97
15	14	22	5	41	141	–100
16	0	22	15	37	141	–104
17	0	22	10	32	141	–109
18	17	0	15	32	141	–109
19	14	0	15	29	141	–112
20	0	22	5	27	141	–114
21	17	0	10	27	141	–114
22	14	0	10	24	141	–117
23	17	0	5	22	141	–119
24	14	0	5	19	141	–122
25	0	0	15	15	141	–126
26	0	0	10	10	141	–131
27	0	0	5	5	141	–136

Source: Authors' calculation.

Table 26. **Cost-sharing scenarios (in million EUR): Half-day programme**

Scenario	User-fee	Efficiency	KG-fee	Total	Required	Government
1	11	43	15	69	94	–25
4	9	43	15	67	94	–27
2	11	43	10	64	94	–30
5	9	43	10	62	94	–32
3	11	43	5	59	94	–35
6	0	43	15	58	94	–36
7	9	43	5	57	94	–37
8	0	43	10	53	94	–41
9	0	43	5	48	94	–46
10	11	22	15	48	94	–46
11	9	22	15	46	94	–48
12	11	22	10	43	94	–51
13	9	22	10	41	94	–53
14	11	22	5	38	94	–56
15	0	22	15	37	94	–57
16	9	22	5	36	94	–58
17	0	22	10	32	94	–62
18	0	22	5	27	94	–67
19	11	0	15	26	94	–68
20	9	0	15	24	94	–70
21	11	0	10	21	94	–73
22	9	0	10	19	94	–75
23	11	0	5	16	94	–78
24	0	0	15	15	94	–79
25	9	0	5	14	94	–80
26	0	0	10	10	94	–84
27	0	0	5	5	94	–89

Source: Authors' calculation.

Table 27. **Cost-sharing scenarios (in million EUR): Three-hour programme**

Scenario	User-fee	Efficiency	KG-fee	Total	Required	Government
1	6	43	15	64	47	17
4	5	43	15	63	47	16
2	6	43	10	59	47	12
5	0	43	15	58	47	11
3	5	43	10	58	47	11
6	6	43	5	54	47	7
7	0	43	10	53	47	6
8	5	43	5	53	47	6
9	0	43	5	48	47	1
10	6	22	15	43	47	–4
11	5	22	15	42	47	–5
12	6	22	10	38	47	–9
13	0	22	15	37	47	–10
14	5	22	10	37	47	–10
15	6	22	5	33	47	–14
16	0	22	10	32	47	–15
17	5	22	5	32	47	–15
18	0	22	5	27	47	–20
19	6	0	15	21	47	–26
20	5	0	15	20	47	–27
21	6	0	10	16	47	–31
22	0	0	15	15	47	–32
23	5	0	10	15	47	–32
24	6	0	5	11	47	–36
25	0	0	10	10	47	–37
26	5	0	5	10	47	–37
27	0	0	5	5	47	–42

Source: Authors' calculation.

6.6 What is Left to pay for the Government?

From Table 25 to Table 27, it can be seen that in most scenarios the outcome for the Government is negative, meaning that level of development-tested user fees, efficiency gains in existing KGs, and KG fees only partly generate funds necessary for full coverage of children aged 3–5.5 years. For full coverage of children in full-day programme, the Government would need to generate between 66 (scenario 1) and 136 (scenario 27) million EUR of additional funds per year; for full coverage of children in half-day programme, the Government would need to generate between 25 (scenario 1) and 89 (scenario 27) million

EUR additional funds per year; for full coverage of children in three-hour programme, the Government would need to generate between 4 (scenario 10) and 42 (scenario 27) million EUR additional funds per year. For the first 9 three-hour programme scenarios the outcome for Government is positive, meaning that the other three sources actually generate more money than is required for the full coverage of children 3–5.5 year currently not covered by the PE. [27]

As we have already said, with 3% GDP growth in 2013 and 0.5% of GDP expenditures on preschool education (OECD level), the Government could generate 220 million EUR earmarked for preschool education and could finance three-hour and half-day preschool education programmes for all children aged 3–5.5 years in Serbia, even without any additional funds from level of development-tested user fees, efficiency gains in existing KGs, and increasing the KG fees for children attending full-day preschool education. With 3% GDP growth in 2013 and 0.5% of GDP expenditures on preschool education (OECD level), and with the help of additional funds generated through the first ten scenarios in Table 25, the Government could generate sufficient funds in order to finance full-day preschool education programmes for all children aged 3–5.5 years in Serbia, whether currently in or out of preschool. This is worth taking into account when making policy decision regarding preschool education in Serbia.

6.7 Chapter Summary

In order to look for sources of money that could cover costs created by expanded coverage, different scenarios were examined including financing with gains from GDP growth, through level of development-tested user fees, through efficiency gains in existing kindergartens, and through raise in fees of full-day programmes. Current modest growth of GDP of 0.5% and the same share of expenditures for PE (0.43% GDP) would create 150 million EUR for PE, whereas this number grows to 190 million with GDP growth of 3% forecasted for 2013. If as the second option share of PE would be raised to 0.5% to reach OECD share, it would generate 180 million EUR with 0.5% of GDP growth and 220 million EUR if GDP growth reaches 3%. With the help of additional funds generated through the cost-sharing scenarios, coming from level of development-tested user fees, efficiency gains in existing kindergartens, and increases in fees for full-day PE programmes, this would generate sufficient funds to cover all children aged 3–5.5 years with full-day PE programmes, whether currently in or out of preschool.

27 Note that additional scenarios are possible if, for example, additional resources gained through user-fees for full-time programmes are mixed with required PE sources for half- and three-hour programmes.

7. START-UP INVESTMENTS FOR ADDITIONAL PHYSICAL AND HUMAN RESOURCE CAPACITIES

This last section of the report focuses on additional physical capacities and human resources above those available from existing resources which are needed in order to accommodate all children aged 3–5.5 years within the preschool education system.

If we take into consideration the estimated number of children 3–5.5 year-olds, who would need to be enrolled into PE to reach 100% enrolment, 4,500 groups of 21 children per group would be needed. If they are enrolled into 3-hour PE programmes, three shifts could operate in the same physical space requiring 1,500 additional classrooms. Distribution of children is not equal across Serbian municipalities, with 63% of children living in municipalities from the first group as per level of development and the rest living in the remaining three groups. If this is taken into account, out of 1,500 additional classrooms for preschool programs, 945 would be needed in 40 municipalities from category 1 and 555 classrooms in the remaining municipalities from categories 2, 3, and 4. This rough estimation is done on the basis of the number of children out of preschool education in 2010. Given the negative demographic trends and likely gradual pace in enrolment rates increases, smaller number of groups and classrooms would be required.

Given the larger number of children and groups needed if we are talking about all children 3–5.5 years old in Serbia, their enrolment would require employment of around 3,000 preschool teachers.

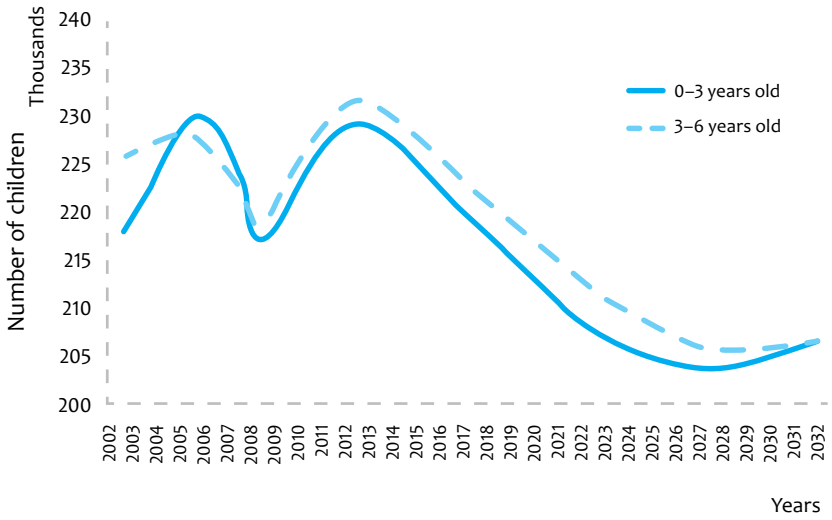
7.1 Declining Demographic Trends

We already discussed the impact of negative demographic trends on increase in PE enrolment rates. These current and future trends are also important in estimating what are the PE capacitates that we might require in future.

The study of Baucal and Ranković (2010), which gives forecasts for preschool children (from 0 to 3 and from 3 to 6 year-olds) population size after 2012, states that there is "a decreasing number of preschool children, reaching a minimum at the end of 2020s when it is expected that the population size of each of two age groups will be about 205 thousands of children" (see Figure 17).[28]

28 RSO projections for the number of children in age groups from 0 to 4 years and from 5 to 9 years in 2020 are even less optimistic. Calculating the number of children from 3 to 5.5 years as half of the number of children from 0 to 4 years plus one quarter of the number of children from 5 to 9 years, we come to the projection 175 thousands children in this age group in 2020.

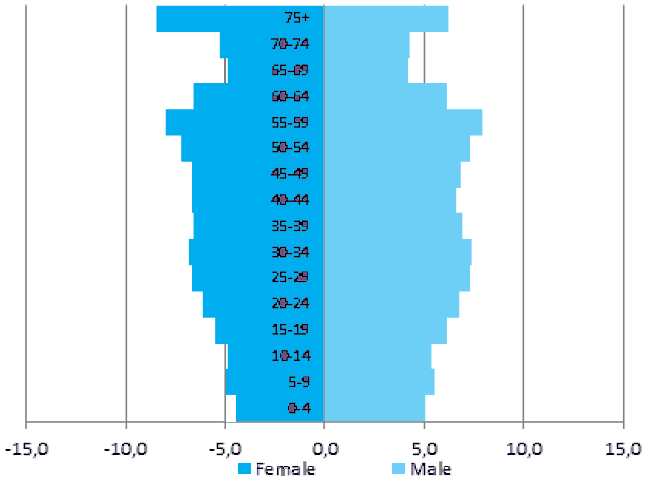
Figure 17. **Actual population size (until 2008) and forecasts (until 2032) for two cohorts (0–3 and 3–6 years old) relevant for two tiers of the preschool education (child care service and kindergartens)**



Source: Baucal and Ranković (2010).

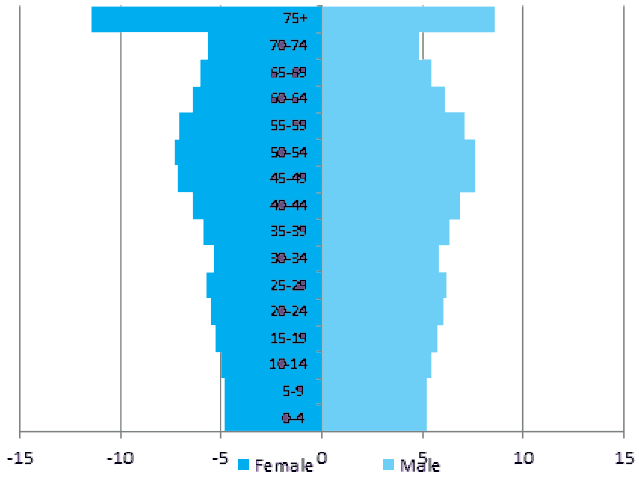
Similarly, Figure 18 shows current demographic profile in Serbia according to the RSO, while Figure 19 shows country future demographic profile in 2032 (RSO). The two population pyramids clearly show a decline in a number of children between ages 0 and 5 years, which will impact not only a demand for the ECD programmes, but also other forms of education. Large age cohorts born before 1990s are moving out of the education system, freeing up space and resources at all levels.

Figure 18. **Population pyramid in Serbia, across age and gender, 2010 estimates (%)**



Source: Population estimates, Serbian RSO

Figure 19. **Population pyramid in Serbia, across age and gender, 2032 estimates (%)**



Source: Population estimates, Serbian RSO

7.2 Alternatives in Order to Provide Additional Physical Capacities for Preschool Education

In finding solutions for how to find additional physical capacities, we can look through the following options:

- Freeing up space in primary schools due to negative demographic trends
- Moving PPP from kindergartens into primary schools
- Filling up the capacities of existing preschool institutions
- Adapting existing community spaces for preschool education and building new kindergartens

Freeing up Space in Primary Schools due to Negative Demographic Trends

According to Levitas and Herczynski (2006), primary school enrolment in 2015/2016 will be about 690,000 pupils, with a pupil/teacher ratio of about 18 pupils per teacher. This rise in pupils' enrolment (4% more in comparison to 2003/2004 school year) is not big enough to justify maintaining most of the 1,600 satellite facilities that currently serve less the 30 pupils. This would create additional available capacities in terms of physical space and human resources in order to accommodate children in full-day and half-day preschool education. Further, retraining primary school teachers to become ECD teachers may prevent many teachers from becoming unemployed and limits the expenditures on unemployment benefits.

Moving PPP from Kindergartens into Primary Schools

According to the MoE data, out of 6,828 groups of children from 3 to 6.5 years, 3,639 were PPP groups for children from 5.5 to 6.5 years (1,030 groups are full-day groups and 2,608 are half-day groups). Following these data, ***if PPP were moved to schools***, 3,639 groups would stay empty and would be able to accept children from 3 to 5.5 which are currently out of preschool education. If these groups had optimal number of children for this age cohort (21 children per group) this means that the existing capacities would be able to accept additional 76,419 children from 3 to 5.5 years in total. This is more than two-thirds out of 93,445 children aged 3–5.5 years currently not covered by KG.

Filling the Capacities of Existing Preschool Institutions

Taking into account regional characteristics at the municipality level which we discussed in Chapter 2 and looking at Figure 6, there are 47 municipalities (e.g., Preševo, Merosina, Irig, Sečanj, etc.) in which the capacities of preschool institutions for children from 3 to 5 years are not full, that is, the number of children per group is smaller than the one prescribed by the Law (21 children per group). If we sum up free spaces in all preschool groups in these municipalities in 2010/2011, we conclude that ***in existing preschool education capacities there is space*** for enrolment of additional 1,022 children from 3 to 5 years, with extra financial resources required only in order to provide transportation (i.e., school bus).

Adapting Existing Community Spaces for Preschool Education and Building New Kindergartens

These spaces could be created in newly built kindergartens, but could also be accommodated in existing primary schools or community building, especially in rural areas which have a shortage of preschool institutions. The latter would logically require start-up costs for refurbishment and adaptation of spaces which would still be considerably lower than investments into new buildings. Delivery of 3-hour programmes would require more modest conditions of the physical environment as children do not need to sleep or eat in a preschool facility.

Analysis presented in Chapter 2 on regional differences in coverage, that clustered municipalities into 4 groups, can give some direction in defining different policy recommendation in as follows:

- **Higher enrolment rates — higher children/group ratio.** Municipalities which belong to this segment (e.g., Novi Sad, Čačak, Užice, some Belgrade municipalities like Zvezdara, Čukarica, Novi Beograd (New Belgrade), etc.) have higher enrolment rates than the national average for Serbia, while the preschool groups are full and admit children over their capacities. In these municipalities there is a need for new preschool objects or alternative preschool programmes in order to meet the high demand.

- **Higher enrolment rates — lower children/group ratio.** Municipalities in this segment (e.g, Čoka, Nova Crnja, Senta, Ada, etc.) might have surplus of capacities over existing demand. Reasons for lower children/group ratio should be further investigated in order to check whether provision of preschool services could be reorganized. For example, instead of having several preschool

groups in each of these locations, it might be better to assign children to one mixed preschool group or children to one mixed preschool group in the most appropriate neighbouring city with the provision of transportation facilities. Alternatively, for municipalities in this segment, provision of mobile kindergartens might also be an option.

- **Lower enrolment rates — lower children/group ratio.** Municipalities in this segment (e.g., Irig, Preševo, Bela Palanka, Nova Crnja, Vladičin Han, etc.) have sufficient capacities, but there seems to be no interest among parents for preschool services and/or the services are not fully accessible for children (i.e., they are too far away from home without organised transport, they are too expensive, etc.). Considering development and educational functions of preschool programmes, the reasons for non-enrolment should be further examined. Based on this information, strategy for increasing preschool enrolment should be established, focussing on provisions of better accessible kindergartens and/or on educating parents about preschool formative role and the long-term benefits of preschool education.

- **Lower enrolment rates — higher children/group ratio.** Municipalities in this segment (e.g., Kragujevac, Leskovac, Loznica, Novi Pazar, Sjenica, etc.) have enrolment rates under the national average, while at the same time the preschool capacities are full. On one hand, in these municipalities available capacities are better used in comparison to other municipalities. On the other hand, these municipalities seem to have the highest need for more preschool services, since the current capacities are not enough for existing needs and they should be expanded as the preschool enrolment increases.

The working assumption of this report was the fact that if the Government ensures funding for the recurrent costs of preschool education, resources for the start-up costs and initial capital investments could be looked for among donors and loans.

7.3 Chapter Summary

Finally, the last chapter reviews additional physical capacities and human resources that are needed in order to accommodate all children 3–5.5 year-olds into PE. Very rough calculations show that enrolment of the currently not enrolled 3–5.5 year-olds would require a total of around 4,500 PE groups of 21 children per group. If they are enrolled into 3-hour programmes that could be organized in 3 shifts, around 1,500 additional spaces or classrooms would be needed: 945 in municipalities from development category 1 and 555 in the remaining municipalities from categories 2, 3, and 4. Enrolment of this number of children would also require employing a total of around 3,000 preschool teachers. With the current declining demographic trends and the more realistic gradual increase of preschool enrolment, required number of spaces and teachers is probably lower. Demographic trends clearly show decline in the number of children which will impact not only demand for ECD programs but will also free up space and resources at other levels of education. Freeing up space in primary schools could create additional available capacities for PE. The option in which the 3,639 PPP groups would be moved to primary schools would free space for more than two thirds of children 3–5.5 year-olds that are currently not enrolled into preschool. Some space is already available in kindergartens that have below average number of children per group and could accommodate additional 1,022 children.

New preschool spaces could be created through construction of new preschool building, but space could also be looked for within existing community spaces and primary schools. It would require investment for adaptation and refurbishment, but these expenditures would be much lower than construction of new preschool buildings. Delivery of 3-hour programmes would require more modest investment as children do not need to sleep or eat in the preschool facility. Analysis of territorial differences in relation to the number of children per group and municipal enrolment rates gives useful directions for policy interventions for different types of municipalities. If recurrent costs of preschool education are covered from sustainable sources such as Governmental budgets, funds for the start-up investment can be looked for among foreign donors, such as the EU with its various programmes, the World Bank, various bilateral donors, and national and international private companies with requests and proposals to contribute.

8. CONCLUSIONS AND RECOMMENDATIONS

The main conclusion of the report is that the introduction of a universally accessible 3–4 hour preschool education programme for all children aged 3–5.5 would be a cost-effective measure to benefit the Serbian state and its citizens.

Overall Conclusions

- **Preschool education plays a very important role in children's development.** It enhances health, success in education, labour productivity and even the nation's prosperity and competitiveness in the long run, as shown by the research and analysis detailed in the report.
- **Preschool education is particularly beneficial for children from deprived groups.** Children from lower socio-economic groups yield a much higher rate of return on investment in early childhood education.
- **Currently preschool services are not used by those who need it the most.** Higher enrolment rates are associated with children from better off families, parents with higher education and from urban environments with significantly lower rates among the poorest, rural and Roma children.
- **The current network of preschool institutions is not adequate in terms of geographical coverage and physical capacity.** Frequently preschool institutions are absent where there is the highest need (in under-developed and rural areas).
- **Local Governments are bearing 80% of current preschool education costs.** As the majority of people benefitting from this expenditure are from higher socio economic groups, this brings into question principles of social justice and equitable distribution of the available resources.
- **Serbia has an adequate strategic and legal framework to further the expansion of preschool education.** The importance of preschool education is recognized and the Government is committed to improvements.
- **Investments into preschool education have the highest return rates and present one of the most profitable investments Governments can make.**

General Recommendations

- **Current level and share of expenditures for preschool education is lower than in OECD countries and should be increased.** At the same time, when low coverage is taken into account, data also indicate a need for further analysis on the possibilities for increased efficiency.
- **Preschool education should be a strategic interest of the state and not only responsibility of municipalities and parents.** Given its importance, overall benefits to the state and high rates of return on investment, preschool education should be a responsibility of the state.

- **Policy makers should revisit the responsibility of local Government to finance preschool.** Given the current inequalities in coverage, related to levels of municipal development, there are good reasons for the central Government to intervene and support underdeveloped municipalities to reach higher preschool coverage rates. Depending on the economic situation and potential growth of GDP in the future, this support could be extended to all municipalities.

- **The further development of the network should be primarily based on the educative function of preschool education.** This expansion should explore making use of existing municipal premises and leveraging partnerships with donors, the private sector and other stakeholders.

- **Parents should be informed and educated on the benefits of preschool education.** Besides the lack of physical capacity and costs associated with attendance of preschool education, more than half of parents do not recognize value of preschool education for development of their children. This aspect must be addressed, to ensure that any investments in physical capacities will have the maximum impact on coverage.

- **Demographic trends should be further analysed.** The negative demographic trends have been a key driver in increased rates of preschool coverage but alone are not sufficient to increase coverage rates to the desired national targets. These trends should be further analysed to determine the extent to which further decreases in the number of children will free primary school capacities and leave space for their utilisation for preschool programmes.

Specific Recommendations

- **The introduction of a universally accessible 3–4 hour preschool education programme for all children aged 3–5.5 would be a cost-effective measure to benefit the Serbian state and its citizens.** Introducing the universality in access and coverage would have the highest chances of reaching the most vulnerable. The 3–4 hour programmes should be free of charge and available to all children 3–5.5 years old. Gradual introduction of this provision, first to children 4–5.5 years old and then 3 years old, would decrease pressure both on physical capacities for preschool education and additional resources needed.

- **3–4 hour programmes are the most cost-effective way to provide preschool education.** As there is no real benefit seen in developmental outcomes for a full day rather than a shorter programme, and as shorter day programme has significantly lower costs, 3–4 hour programmes have the most favourable cost-benefit ratio. The large proportion of children currently attending full-day programmes are doing so for custodial, rather than educational reasons.

- **Enrollment of all children that are currently out of preschool education into 3–4 hour programmes would require investment of maximum 46 million EUR.** The cost of the 3–4 hour free of charge programmes for all children 3–5.5 years old presents around 60% of the current funds provided by municipal budgets for preschool education.
  Participation of parents in cost sharing should remain for children using full-day programmes. The Ministry of Education could propose a national set of criteria for fee reduction and fee waiving for the full- day programmes, based on equity principles. There is also scope to increase share of full-day programme costs paid by parents, based on their wealth status.

Recommendations related to data

Inconsistencies in the available data and lack of adequate data were noted throughout the process of development of this study. In order to improve the situation and enable future more precise calculations and analysis as a basis for policy making related to preschool education, some additional recommendations are made:

- The Statistical Office of the Republic of Serbia and the Ministry of Education, Science and Technological Development should harmonize methodologies of data collection, processing and presentation in the area of preschool education. It is particularly important to align the frequency of data collection, in terms of school versus calendar years.

- Preschool education statistics should be further aligned with international, particularly EU practice to enable comparison between countries.

- Instruments for data collection should be revised to include parameters that will enable analysis per different types of preschool programmes in relation to number of children attending, gender and type of settlements.

- Ways should be found to improve availability of data on children from vulnerable groups in preschool education.

- Information on preschool expenditures from Treasury should be available not only across different expenditures categories but also across different preschool education programmes (crèche, kindergarten, PPP) and more aligned with accountancy of preschool institutions.

LITERATURE

Baucal A. and Ranković T. (2010), "Education in Serbia: Thematic review 2009," European Investment Bank, Belgrade.

Council of the European Union (2009), "Council Conclusions on a strategic framework for European cooperation in education and training (ET2020)," Council of the European Union, Brussels.

EACEA (2009), "Early Childhood education and care in Europe: Tackling Social and Cultural Inequalities (ECEC in Europe)," European Commission, Education, Audiovisual and Culture Executive Agency, Brussels.

Engle, P., Black, M., Behrman, J., Cabral de Mello, M., Gertler, P., Kapiriri, L., Martorell, R., and Young, M. (2007), "Strategies to avoid the loss of developmental potential in more than 200 million children in the developing world," The Lancet, 369 (9557, 20), pp. 229–242.

European Commission (2010), "EUROPE 2020 European strategy for smart, sustainable and inclusive growth (Europe 2020, ec.europa.eu/eu2020/)," European Commission, Brussels.

Gonzalez–Mena, J. (2009), "Child, Family, and Community: Family-Centered Early Care and Education," Pearson Education Inc.

Government of the Republic of Serbia (2003), "Poverty Reduction Strategy Paper (PRSP)," Government of the Republic of Serbia, Belgrade.

Government of the Republic of Serbia (2004), "National Plan of Action for Children (NPA)," Government of the Republic of Serbia, Belgrade.

Government of the Republic of Serbia (2006), "National Millennium Development Goals (NMDG)," Government of the Republic of Serbia, Belgrade.

Government of the Republic of Serbia (2006), "Book of Regulations of Fundamentals for Preschool Programmes (BRFPP)," Official Gazette, Belgrade.

Government of the Republic of Serbia (2009), "Law on the Fundamentals of the Education System (LFES)," Official Gazette, Belgrade.

Government of the Republic of Serbia (2010), "Law on Preschool Education (LPE)," Official Gazette, Belgrade.

Government of the Republic of Serbia (2010), "Regulation on the criteria for the adoption of act on the network of preschools and act on a network of primary schools [Uredba o kriterijumima za donošenje akta o mreži predškolskih ustanova i akta o mreži osnovnih škola]," Official Gazette, Belgrade.

Government of the Republic of Serbia (2011), "Law on Supplements and Amendments made on the Law on the Fundamentals of the Education System," Official Gazette, Belgrade.

Government of the Republic of Serbia (2011), "The First National Report on Social Inclusion and Poverty Reduction in the Republic of Serbia," Government of the Republic of Serbia, Belgrade.

Government of the Republic of Serbia (2008), "Memorandum on budget of Republic of Serbia, 2009," Official Gazette, no. 113/2008 and 49/2009, Belgrade.

Government of the Republic of Serbia (2009), "Memorandum on budget of Republic of Serbia, 2010," Official Gazette, no. 112/2009, Belgrade.

Government of the Republic of Serbia (2010), "Memorandum on budget of Republic of Serbia, 2011," Official Gazette, no. 73/10, Belgrade.

Heckman, J. J. (2000), "Policies to Foster Human Capital," Research in Economics, 54, pp. 3–56.

Heckman, J. (2007), "Skill formation and the economics of investing in disadvantaged children," Science, 312, pp. 1900–1902.

Heckman, J. and Masterov, D. (2007), "The productivity argument for investing in young children," Science, 29(3), pp. 446–493.

Ivić I., Pešikan A. and Jankov R. (2010), "Situation analysis of educational institutions network, human resources and educational statistic in Serbia," Ministry of Education of Republic of Serbia, Belgrade.

Levitas, T. and Herczynski J. (2006), "The Finance and Management of Primary Education in Serbia: Findings and Recommendations," Development Alternatives Inc.

Lynch, R. G. (2005), "Policy Perspectives," WestEd, San Francisco, California.

Myers, R. G. (2008), "Costing early childhood care and development programmes," Online Outreach Paper, Bernard van Leer Foundation.

Ministry of Education and Science of the Republic of Serbia (2011), "Analysis of territorial coverage and children enrolment in institutional preschool education with special focus on children from vulnerable groups in working 2010/2011 year (Analysis of preschool education)," Ministry of Education and Science of the Republic of Serbia, Belgrade.

Ministry of Education and Science of the Republic of Serbia (2011), "Report on the realization of Preparatory Preschool Programme in working 2010/2011 year," Ministry of Education and Science of the Republic of Serbia, Belgrade.

Ministry of Education and Science of Republic of Serbia (2012), "National Strategy of Education Development in Serbia until 2020," Forthcoming, Ministry of Education and Science of Republic of Serbia, Belgrade.

OSI (2007), "Equal Access to Quality Education for Roma Volume 1: Bulgaria, Hungary, Romani and Serbia," Open society Institute, Belgrade.

OSI (2010), "Indicators of Equal Access to Quality Education for Roma," Open society Institute, Belgrade.

OECD (2011), "PISA in Focus: Does participation in pre-primary education translate into better learning outcomes at school?," Organisation for Economic Co-operation and Development, Paris.

Pešikan A. and Ivić I. (2009), "Education against poverty: Analysis of effects of PPP introduction in Serbia," Ministry of Education of Republic of Serbia, Belgrade.

Shonkoff, J. P. and D. A. Phillips (Eds.) (2000), "From neurons to neighbourhoods," Committee on Integrating the Science of Early Childhood Development, Board on Children, Youth, and Families.

Statistical Office of the Republic of Serbia (2011), "Multiple Indicator Cluster Survey, 2011, Final Report (MICS4)," UNICEF, Belgrade.

Statistical Office of the Republic of Serbia (2011), "Regulation on Plan of Official Statistics for 2011 year," Statistical Office of the Republic of Serbia, Belgrade,

http://webrzs.stat.gov.rs/WebSite/Public/PageView.aspx?pKey=286

Statistical Office of the Republic of Serbia (2007), "Demographic Yearbook 2006," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2008), "Demographic Yearbook 2007," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2009), "Demographic Yearbook 2008," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2010), "Demographic Yearbook 2009," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2011), "Demographic Yearbook 2010," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2011), "Statistical Yearbook of Serbia 2010," Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2007), "Statistical Release DD20, Institutions for children of preschool age in Serbia in 2006/2007, Republic of Serbia, by municipalities," No. 112 — year LVII, 28th June 2007, Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2008), "Statistical Release DD20, Institutions for children of preschool age in Serbia in 2007/2008, Republic of Serbia, by municipalities," No. 27 — year LVIII, 28th February 2008, Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2009), "Statistical Release DD20, Institutions for children of preschool age in Serbia in 2008/2009, Republic of Serbia, by municipalities," No. 30 — year LIX, 27th March 2009, Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2010), "Statistical Release DD20, Institutions for children of preschool age in Serbia in 2009/2010, Republic of Serbia, by municipalities," No. 105 — year LX, 28th April 2010, Statistical Office of the Republic of Serbia, Belgrade.

Statistical Office of the Republic of Serbia (2011), "Statistical Release DD20, Institutions for children of preschool age in Serbia in 2010/2011, Republic of Serbia, by regions," No. 100 — year LXI, 20th April 2011, Statistical Office of the Republic of Serbia, Belgrade.

Van Ravens, J. (2010), "Fair play — A financial feasible plan for equal access to ECP in Republic of Macedonia," UNICEF, Skopje.

Vujić S. and Baronijan H. (2011), "Preschool education and school performance: Evidence from PISA 2009," Working Paper.

Woessmann, L. (2006), "Efficiency and Equity of European Education and Training Policies," CESifo Working Paper No. 1779.

APPENDIX

STRATEGIC AND LEGISLATIVE FRAMEWORK FOR PRESCHOOL EDUCATION IN SERBIA

A.1 The Law on the Fundamentals of the Education System

Articles §70 and §71 of the Law on the Fundamentals of the Education System define the programme and the curriculum for preschool education and upbringing. Article §93 regulates duration of preschool education, while Article §97 regulates the enrolment of children into preschool institutions (the focus is on the enrolment into PPP). This Law specified PPP as obligatory preschool education for all children in the age group from 5.5 to 6.5 years. PPP, which is extended from six months in 2006 to nine months in 2009, should be performed in preschool institutions, providing there are available facilities, and otherwise in schools. Further, PPP should be taught by educators from preschool rather than school institutions, since the main purpose of this programme is child development, rather than formal learning provided by school education (LFES, 2009, Article §93).

The Law also introduced a series of regulations which promote inclusive education. The Law further defined the financing of preschool education. For example, the Budget of the Republic of Serbia provides funding for the PPP, delivery of preschool education to children with disabilities and children treated in a hospital (Article §157), while the Budget of the local Governments provide funding for preschool education prior to the PPP. The Law further specifies that local Governments should cover 80% of the economic price of preschool education per child, which includes all costs of a child's stay in a preschool institution, such as teachers' salaries, compensations and other income, social contributions paid by the employer, severance pay, and other current expenditures. The local Governments also cover other costs such as additional staff training, rewards, transport of employees and children who attend PPP, capital expenditures, protection and safety of children, etc. (LFES, 2009, Article §159).

A.2 The Law on Preschool Education

The Law on Preschool Education defines that parents cover the remaining 20% of the economic price of preschool education per child (LPE, 2010, Article §50), except in the case of PPP which is free of charge. It is also specified that the economic price of preschool education per child is the integral part of the Memorandum on budget (LFES, 2009, Article §155). The Law on Preschool Education (LPE, 2010) further defines that the preschool age is from 0.5 months to 5.5 years (LPE, 2010, Article §2). The Law also defines that the founder of public preschool institutions is Local Government (LPE, 2010, Article §9). The same Article stipulates that Local Governments must set up a preschool institution for minimum 5 and maximum 100 educational groups, with the limits introduced in order to enable better management. Articles §10 and §11 define that the founder of a preschool institution can be a legal or a physical person as well as

a foreign country, foreign legal or a physical person, which gives a legal framework for opening private preschool institutions. The Law gives priority to children from sensitive groups (LPE, 2010, Paragraph §13) and allows for special alternative programmes (e.g., preschool programmes for children in hospitals and mobile kindergartens for children aged 4 to 6.5 years), defined in Articles §20 and §21. Regarding inclusive education, the Law defines that maximum two children with special needs could be in one preschool group. Additionally, it is possible that a part of the programme or the whole programme curriculum is delivered in a foreign language. For example, national minorities can have programmes delivered in their own native language and there is also a bilingual programme option (Serbian and another language), providing that at least 50% of parents or guardians choose this option. The Law also defines duration of preschool education programmes (LPE, 2010, Article §27), usually organised as longer than 8 hours a day, from 4 to 8 hours a day, and shorter than 4 hours a day.

Further, the Law on Preschool Education defines a maximum number of children per group in each age cohort (see Table 28), with a maximum of two children with special needs per one preschool group. In case of 3 and 4 year-old children (in focus of this report), these norms have often been exceeded. For example, Table 28 shows that the norm for a number of children from 3 to 4 years (from 4 to 5 years) is 20 (22) children per group. However, in 2010/2011 in each age cohort, the number of children per group has been exceeded by approximately 5 (4) children per group, to 25 and 26 children, respectively. Although the preschool groups are mainly organised according to child's age, there are also mixed groups for children from 3 to 7 years.

Table 28. **Maximum (average) number of children per group in public preschool institution by age categories in school year 2010/2011**

Norms		**Situation in school year 2010/2011**	
Age of children	**Number of children per group**	**Age of children**	**Number of children per group**
From 6 months to 1 year	7		
From 1 to 2 years	12	From 0 to 3 years	16
From 2 to 3 years	16		
From 3 to 4 years	20	From 3 to 4 years	25
From 4 to 5.5 years	22	From 4 to 5 years	26
PPP group	26	From 5 to 6 years	23
		From 6 to 7 years	19
		Mixed groups (3 to 7 years)	17

Notes: Column1: LPE, 2010, Article 30; Column2: Authors' calculation: Number of children divided by number of groups in each age cohort Spreadsheet 2, DD20, RSO, 2010/2011)

The Law defines that children from sensitive groups have priority when entering preschool education (LPE, Paragraph §13). However, the same paragraph also stipulates that the local Government which is the founder of the preschool institution has to determine the criteria for preschool access. As a consequence,

in practice it has been shown that most of the overcrowded preschool institutions enrol first the children of employed parents in support of kindergarten's custodial function, while there is often no place for children from marginalized groups whose parents are usually unemployed.[29]

A.3 Other Policy Measures which Promoted Preschool Participation

- Ministry of Education introduced a pedagogical assistant. Pedagogical assistants were type of fieldworkers, with the aim of detecting children from sensitive groups invisible to the education system (i.e., poor children, children from settlements with insufficient hygienic requirements, children without adequate legal documents, etc.) and help those children attend both PPP and primary school.

- At the same time Ministry of Health introduced health mediators with a primary function of linking education with the health system and provision of health services. However these mediators were also engaged in activities connected with education — help with enrolment in PPP and primary school.

- Provision of transport to the PPP by local Governments for children who live far away from the preschool object (more then 2km).

- Realization of a variety of governmental and non-governmental projects with the main aim to increase the number of children in the education system (these are for example Governmental project called Provision of the Improved Services Locally (DILS),[30] Education for All financed by IPA funds,[31] different projects by the Roma Education Fund (REF),[32] UNICEF etc.)

A.4 The Law on Regional Development

The Law on Regional Development classifies regions and municipalities into different development categories. Regions are divided into 2 groups as per level of development:

- Regions with development level of 75% and higher of the republic average GDP per capita.

- Regions with development level lower than 75% of the average GDP per capita.

29 A similar situation is found in Macedonia. Janeva, Petroska-Beska and Eminovska (2009) report that 75% of the children in the nurseries and 72% of the children in the other kindergarten groups are from double-income families.

30 The project is financed through the World Bank loan, with participation of the Ministries of Education, Health and Labour, and Social Policy. The programme has a general aim of strengthening the capacities of institutions locally in order to provide a uniform quality of accessible services with an emphasis on the needs of vulnerable groups.

31 Promoting accessibility and quality of education for the children of marginalized groups was initiated in 2010 and will last until 2012.

32 The most successful projects supported by the REF in Serbia are: Creating models and standards for teaching and learning Serbian language as a second language; Solutions for the future, which promote inclusion and participation of Roma parents in school bodies (School Councils, Parents' councils, etc.); Incorporating topics of Roma culture and tradition in regular primary school curriculum; Increasing access to preschool education for Roma children; and as a part of the DILS project, introducing Roma coordinators at the level of Municipalities. Other Non-Governmental Organisations (NGOs) were developing alternative modalities in order to include Roma children (through NGO sponsored kindergartens for Roma children, community centres etc.), children with disabilities, etc.

Regions are characterised as undeveloped if they fall into group 2) and if they have demographic decline higher than 50% in the period from 1971 till today. Municipalities are then classified into 4 groups depending on the level of their development:

- **I group** — level of development above the national average

- **II group** — level of development between 80% and 100% of the national average:
  Aleksandrovac, Ada, Bač, Bački Petrovac, Bor, Vranje, Zaječar, Kladovo, Kraljevo, Lapovo, Loznica, Lučani, Novi Bečej, Novi Kneževac, Odžaci, Paraćin, Požega, Ruma, Sokobanja, Titel, Topola, Ćuprija, Šid.

- **III group** — level of development between 60% do 80% of the national average:
  Aleksinac, Aranđelovac, Bajina Bašta, Batočina, Bogatić, Boljevac, Velika Plana, Veliko Gradište, Vladimirci, Despotovac, Dimitrovgrad, Žabalj, Ivanjica, Irig, Kovačica, Kovin, Koceljeva, Leskovac, Ljig, Majdanpek, Mali Iđoš, Negotin, Nova Varoš, Novi Pazar, Opovo, Priboj, Prokuplje, Raška, Svilajnac, Sečanj, Smederevska Palanka, Srbobran, Trstenik, Ćićevac, Ub, Čoka.

- **IV group** — level of development below 60% of the national average:
  Alibunar, Babušnica, Bela Palanka, Bela Crkva, Blace, Bojnik, Bosilegrad, Brus, Bujanovac, Varvarin, Vladičin Han, Vlasotince, Gadžin Han, Golubac, Doljevac, Žabari, Žagubica, Žitište, Žitorađa, Knić, Knjaževac, Krupanj, Kuršumlija, Kučevo, Lebane, Ljubovija, Mali Zvornik, Malo Crniće, Medveđa, Merošina, Mionica, Nova Crnja, Osečina, Petrovac, Plandište, Preševo, Prijepolje, Ražanj, Rača, Rekovac, Svrljig, Sjenica, Surdulica, Trgovište, Tutin, Crna Trava.

- **Devastated municipalities** — level of development below 50% of the national average:
  Babušnica, Bela Palanka, Blace, Bojnik, Bosilegrad, Bujanovac, Varvarin, Vladičin Han, Vlasotince, Gadžin Han, Golubac, Doljevac, Žabari, Žagubica, Žitište, Žitorađa, Knić, Krupanj, Kuršumlija, Kučevo, Lebane, Ljubovija, Mali Zvornik, Malo Crniće, Medveđa, Merošina, Mionica, Nova Crnja, Osečina, Plandište, Preševo, Prijepolje, Ražanj, Rača, Rekovac, Svrljig, Sjenica, Trgovište, Tutin, Crna Trava.

Devastated municipalities include municipalities from the 4th group whose level of development is below 50% of the national average.

PRESCHOOL EDUCATION AND DEMOGRAPHIC STATISTICS IN SERBIA

Two main institutions which follow education statistics in general and preschool education statistics in particular are the Republic Statistical Office (RSO) and the Ministry of Education (MoE). However, due to methodologies which are not harmonized, the figures on preschool coverage from these two institutional sources can significantly differ (Ivić, Pešikan, and Jankov, 2010). Further, demographic numbers on children in preschool age cohorts (before the age of 7) are recorded by the Republic Statistical Office (RSO). The Treasury of the Republic of Serbia collects information on different preschool expenditures categories at the level of municipalities (function 911). In what follows, we provide a brief discussion of the differences between the data collected by the RSO and MoE, and we describe the data collected by the DD20 RSO, RSO demographic numbers (Census), and the Treasury data on preschool expenditures. At the end of this section, we describe the working sample size, the procedure of merging/appending across different sources of data, and we discuss some pertinent data issues.

A.5 Information on Preschool Attendance from the DD20 RSO

Statistical Release DD20 RSO *Institutions for children of preschool age* provides the following information per year and municipality in the period from school year 2006/2007 until 2010/2011:

At the preschool level (spreadsheet 1):

- Number of preschool objects;
- Number of preschool groups in each of these objects;
- Number of children in each of these preschool categories (up to 3 and older than 3 years);
- Whether preschools operate full (more than 8 hours per day) or part time (up to 4 hours or between 4 and 8 hours per day);[33]
- Whether preschools operate in a building of a crèche, kindergarten or a school;
- Number of children who were not accepted due to the limited preschool institution capacity, children who were accepted over the preschool capacity and children under the guardianship (*"pod starateljstvom"*).

At the child level (spreadsheet 2):

33 It should be noted here that the RSO statistics collected information on preschool institutions programmes longer than 8 hours a day, from 5 to 9 hours a day, and shorter than 5 hours a day in 2009/2010, and longer than 9 hours a day, from 6 to 9 hours a day, and shorter than 6 hours a day in 2010/2011.

- Number of children in each age category attending preschool and type of preschool (full day, half day or three hours);

- Age categories: up to 18 months, 18 months to 2 years, 3–4 years, 4–5 years, 5-7 years (includes PPP) and mixed age 3-7 years

At the child level (spreadsheet 3):

- Coverage by the PPP

Statistical Release DD20 RSO only has the data on the number children and the number of groups in preschool institutions using the following age categories: up to 3, 3 to 4, 4 to 5, 5 to 6 and 6 to 7 years, children in mixed groups (from 3 to 7 years)[34] (spreadsheet 2), as well as the number of children who attend the PPP (children from 5.5 to 6.5 years) (spreadsheet 3). Since the focus of this report is on children in the age group from 3 to 5.5 years, this age group is calculated in two ways, depending on the data source (spreadsheet in the RSO DD20) and year.

- **Definition 1.** From the data at the child level (spreadsheet 2), where we have information on the number of children in each age category attending preschool and type of preschool (full day, half day or three hours):

  In years 2007–2009

  age 3 to 5.5 yrs = age 3 to 4 yrs + age 4 to 5 yrs + 1/4*age 5 to 7 yrs + 5/8*age 3 to 7 yrs

where we have assumed that there is an equal weight on the number of children in each age category in the group of children from 5 to 7 years and in the mixed age group of children from 3 to 7 years. Further, all children attending three-hour preschool programme are added to the 3 to 5.5 years age category, since both crèche (before age of 3) and PPP (after age of 5.5) *cannot* be attended as three-hour programmes.

- **Definition 2.** From data at the child level (spreadsheets 2 and 3), where we have information on the number of children in each age category attending preschool and the number of children attending PPP:

  In years 2007–2009

  age 3 to 5.5 yrs = (age 3 to 7 yrs (mix) + age 5 to 7 yrs - PPP) + age 3 to 4 yrs + age 4 to 5 yrs

  In years 2010–2011

age 3 to 5.5 yrs = (age 3 to 7 yrs (mix) + age 5 to 6 years + age 6 to 7 yrs - PPP) + age 3 to 4 yrs + age 4 to 5 yrs

34 Mixed groups in preschool education are groups consisting of children between ages 3 and 7. They represent 10.7% of all preschool education groups in Serbia. For example, in Belgrade, Vojvodina, and Central Serbia there are 5.9%, 10.9%, and 13.4% children in mixed groups, respectively.

Since the PPP coverage is only reported at the aggregate level (for children both in full-time and part-time preschool education programmes), calculating the number of children attending preschool education between ages 3 and 5.5 years using this approach only gave us *aggregate numbers*, without knowing which type of preschool programme (full day, half day or three hours) children attended.

Two ways of calculating the target group of children (3 to 5.5 years) attending preschool is very close to one another for some municipalities.[35] However, for some municipalities, the two figures differ to a large extent probably due to the fact that the proportion of children in mixed groups compared to the children in other groups vary across the municipalities. Because of this, the second definition on the number of children in the age group 3–5.5 years might be less prone to a measurement error. However, the first second definition enables calculation of the number of children in PPP across different type of PE programmes (full-day and half-day), using the following indirect formula:

children in PPP = total no. of children in PE - 3 to 5.5 years children in PE - up to 3 years children in PE

Therefore, the first definition has been used when calculating the unit costs in Chapter 4, based on the data for the years 2007-2009. The second definition has been used in the remainder of this report, based on the data for the years 2010/2011. At the national level, the difference between the two definitions in the total number of children PE in the age group 3 to 5.5 years is less pronounced in 2007 (80,504 according to the first and 80,551 according to the second definition); the difference between two numbers is more pronounced in 2009 (84,571 according to the first and 80,393 according to the second definition).[36]

As we see above, the way DD20 RSO collects information on preschool attendance enables statistical analysis broken down by *different levels*:

- Level and type of preschool institution, depending on the number of preschool objects, number of preschool groups in each of these objects, whether preschools operate in a building of a crèche, kindergarten or a school, etc.;
- Level of children and type of preschool programme attended (full day, half day or three hours);
- Level of children who attend the PPP programme, without differentiating between the type of preschool education programme (i.e., having children both in full-time and part-time preschool education programmes).

Number of Children per PE Group and other Support Information in Figure 6.

The number of children groups in age cohort 3 to 5.5 years per municipality is not easy to estimate. On one hand only RSO collects data at the municipality level, but on the other hand RSO does not collect precise data about the programme which these groups follow (PPP or kindergarten program). Table 29 shows the total number of children and number of groups (in PE as well as in PPP) in 2010/11 presented

35 For three municipalities (Bogatić, Kursumlija and Ljig), data on PPP attendance are missing in 2007. Therefore, for these three municipalities, we replaced the PPP numbers with the numbers obtained in the indirect calculation of the PPP attendance from DD20 (spreadsheet 2: total number of children in PE — children in age group 3–5.5 years in PE — children in age group 0-3 years in PE).

36 These totals were calculated base on all 147 municipalities in Serbia.

in Statistical Release DD20 of Statistical Office of the Republic of Serbia. On the other hand, out of total number of children enrolled in PPP in 2010/2011 (68,049 children), we can assume that 45,260 children enrolled into PPP were in groups from 6 to 7 years. The rest of 22,789 children were probably in groups from 5 to 6 and in mixed groups, but these groups were not always strictly PPP or kindergarten groups (until 2011/2012 it was possible that some children from the same group follow PPP and some follow kindergarten programme). This is the reason why it is not possible to calculate the average number of children per group for the children above 3 years who do not follow PPP, that is, for the children from 3 to 5.5 years. Hence, we have decided to limit our calculations only to not-mixed groups of children from 3 to 5 years for which reliable data exist (Table 29).

Table 29. **Number of children and number of groups in each age cohort in Serbia in 2010/11**

Total		**Up to 3 years**		**3 to 4 years**		**4 to 5 years**		**5 to 6 years**		**6 to 7 years**		**Mixed (3–7)**	
Group	Child	Group	Child	Group	Child	Group	Child	Group	Child	Group	Child	Group	Child
8,791	17,9865	1,713	27,521	1,017	25,064	1,116	28,473	1,651	37,764	2,352	45,260	942	15,783

Source: Table 2, DD20, RSO

Data used in Figure 6 are as follows:

- Number of children from 3 to 5.5 years enrolled in preschool education per municipality, calculated using definition 2 above (*Source: DD20 for 2010, RSO*)
- Estimated number of children from 3 to 5.5 years per municipality (*Source: RSO estimates of no. of children 3–5.5 years on the level of municipality for 2010*).
- Number of groups of children from 3 to 5 years per municipality (*Average number of children 3–4 years per group + average number of children 4–5 years per group)/2), DD20 for 2010, RSO*)[37]

A.6 Demographic Numbers on Preschool Children from the RSO (Census Data)

We have obtained the total number of children per year, per age category, and per municipality in order to see how many children in each of the analysed years and at the level of municipalities are not covered by the preschool education.[38] The total number of children in the age category 3–5.5 years is estimated as follows:

age 3 to 5.5 yrs = age 3 yrs + age 4 yrs + age 5 yrs/2

37 Mixed groups of children from 3 to 7 years are not included as well as groups of children from 5 to 6 years since we do not know which of these groups the PPP groups are and sometimes in the same group are children who follow regular preschool programme and children that follow PPP.

38 Demographic data from the Republic Statistical Office (RSO) are kindly provided by Paun Čukavac.

The total number of children in the age category 3 to 5.5 years in the period 2007-2009, based on all 147 municipalities in Serbia is presented in Table 30. According to the data obtained from the RZS (RSO), we see that the total number of children in age category 3 to 5.5 years was 189,178 in 2007, 192,583 in 2008, and 185,298 in 2009. Over all three analyzed years, there were about 49% of female children in the age category 3–5.5 years.

Table 30. **Total number of children in the age category 3–5.5 years in the period 2007-2009**

Year	Total number of children 3–5.5 years	Number of female children 3–5.5 years (%)
2007	189,178	91,826 (49%)
2008	192,583	93,398 (48%)
2009	185,298	89,912 (49%)

Source: RZS (RSO) and authors' calculations.

A.7 Information on Preschool Expenditures from the Treasury

Total Preschool Expenses per Type of Preschool (in 000 dinars)

Using information on preschool expenses from the Treasury and dividing total expenses on preschool with a proportion of children in each age group (crèche, KG, and PPP) per year and per municipality enabled us to indirectly calculate actual costs per type of PE institution over the three benchmarked years (2007–2009) for all municipalities in Serbia. The formula looks as follows:

$$TPE = \frac{children\ in\ creche}{total\ no\ of\ children\ in\ PSU} * TPE + \frac{children\ in\ KG\ (3–5.5\ yrs)}{total\ no\ of\ children\ in\ PSU} * TPE +$$

$$+ TPE = \frac{children\ in\ PPP}{total\ no\ of\ children\ in\ PSU} * TPE$$

where *TPE* denotes the total preschool expenses and *PSU* denotes the preschool institution. For the brevity of exposition, we have dropped the indexes *i* indicating municipality (*i*=1,136)[39] and *t* indicating year (*t* = 2007–2009). We used Equation above in order to calculate total PE expenditures (from Government and parents), as well as PE expenditures per type of preschool institution.

39 The actual number of municipalities is 147. However, because the data from the Treasury are missing for some municipalities, we had to drop these municipalities from further analysis.

Categories of Expenses Listed in the Official Gazette (Službeni Glasnik, in Serbian)[40]

4100 "Rashodi za zaposlene"
4110 "Plate, dodaci i naknade zaposlenih (zarade)"
4111 "Plate, dodaci i naknade zaposlenih (zarade)"
4120 "Socijalni doprinosi na teret poslodavca"
4121 "Doprinos za penzijsko i invalidsko osiguranje"
4122 "Doprinos za zdravstveno osiguranje"
4123 "Doprinos za nezaposlenost"
4130 "Naknade u naturi"
4131 "Naknade u naturi"
4140 "Socijalna davanja zaposlenima"
4141 "Isplata naknada za vreme odsustvovanja s posla na teret fondova"
4142 "Rashodi za obrazovanje dece zaposlenih"
4143 "Otpremnine i pomoci"
4144 "Pomoc u medicinskom lecenju zaposlenog ili clanova uze porodice i druge pomoci zaposlenom"
4150 "Naknade troskova za zaposlene"
4151 "Naknade troskova za zaposlene"
4160 "Nagrade zaposlenima i ostali posebni rashodi"
4161 "Nagrade zaposlenima i ostali posebni rashodi"
4200 "Koriscenje usluga i roba"
4210 "Stalni troskovi"
4211 "Troskovi platnog prometa i bankarskih usluga"
4212 "Energetske usluge"
4213 "Komunalne usluge"
4214 "Usluge komunikacija"
4215 "Troskovi osiguranja"
4216 "Zakup imovine i opreme"
4219 "Ostali troskovi"
4220 "Troskovi putovanja"
4221 "Troskovi sluzbenih putovanja u zemlji"
4222 "Troskovi sluzbenih putovanja u inostranstvo"
4223 "Troskovi putovanja u okviru redovnog rada"
4224 "Troskovi putovanja ucenika"
4229 "Ostali troskovi transporta"
4230 "Usluge po ugovoru"
4231 "Administrativne usluge"
4232 "Kompjuterske usluge"
4233 "Usluge obrazovanja i usavrsavanja zaposlenih"
4234 "Usluge informisanja"
4235 "Strucne usluge"
4236 "Usluge za domacinstvo i ugostiteljstvo"

40 Categories 4824, 4911, 4912 and 5132 were not defined in the Official Gazette (Službeni Glasnik). They have been categorized as a part of the broader category, defined by the first two digits.

4237 “Reprezentacija”
4239 “Ostale opste usluge”
4240 “Specijalizovane usluge”
4241 “Poljoprivredne usluge”
4242 “Usluge obrazovanja, kulture i sporta”
4243 “Medicinske usluge”
4246 “Usluge ocuvanja zivotne sredine, nauke i geodetske usluge”
4249 “Ostale specijalizovane usluge”
4250 “Tekuce popravke i odrzavanje”
4251 “Tekuce popravke i odrzavanje zgrada i objekata”
4252 “Tekuce popravke i odrzavanje opreme”
4260 “Materijal”
4261 “Administrativni materijal”
4262 “Materijali za poljoprivredu”
4263 “Materijali za obrazovanje i usavrsavanje zaposlenih”
4264 “Materijali za saobracaj”
4266 “Materijali za obrazovanje, kulturu i sport”
4267 “Medicinski i laboratorijski materijali”
4268 “Materijali za odrzavanje higijene i ugostiteljstvo”
4269 “Materijali za posebne namene”
4443 “Takse koje proisticu iz zaduzivanja”
4511 “Tekuce subvencije javnim nefinansijskim preduzecima i organizacijama”
4512 “Kapitalne subvencije javnim nefinansijskim preduzecima i organizacijama”
4630 “Transferi ostalim nivoima vlasti”
4631 “Tekuci transferi ostalim nivoima vlasti”
4632 “Kapitalni transferi ostalim nivoima vlasti”
4651 “Ostale tekuce donacije, dotacije i transferi”
4720 “Naknade za socijalnu zastitu iz budzeta”
4721 “Naknade iz budzeta u slucaju bolesti i invalidnosti”
4722 “Naknade iz budzeta za porodiljsko odsustvo”
4723 “Naknade iz budzeta za decu i porodicu”
4727 “Naknade iz budzeta za obrazovanje, kulturu, nauku i sport”
4728 “Naknade iz budzeta za stanovanje i zivot”
4729 “Ostale naknade iz budzeta”
4819 “Donacije ostalim neprofitnim institucijama”
4820 “Porezi, obavezne takse i kazne”
4821 “Ostali porezi”
4822 “Obavezne takse”
4823 “Novcane kazne”
4824 “Porezi, obavezne takse i kazne”
4831 “Novcane kazne i penali po resenju sudova”
4911 “Tekuci rashodi (iz budzeta) “
4912 “Tekuci rashodi (iz budzeta) “
4940 “Tekuci rashodi (iz budzeta)”
4941 “Tekuci rashodi (iz budzeta): Rashodi za zaposlene”

4942 “Tekuci rashodi (iz budzeta): Koriscenje usluga i roba”
4943 “Tekuci rashodi (iz budzeta): Amortizacija i upotreba sredstava za rad”
4944 “Tekuci rashodi (iz budzeta): Otplata kamata i prateci troskovi zaduzivanja”
4945 “Tekuci rashodi (iz budzeta): Subvencije”
4946 “Tekuci rashodi (iz budzeta): Nema”
4947 “Tekuci rashodi (iz budzeta): Prava iz socijalnog osiguranja”
4948 “Tekuci rashodi (iz budzeta): Ostali rashodi”
4951 “Osnovna sredstva”
4952 “Zalihe”
4954 “Prirodna imovina”
4961 “Otplata glavnice”
4962 “Nabavka finansijske imovine”
4991 “Sredstva rezerve”
5110 “Zgrade i gradjevinski objekti”
5112 “Izgradnja zgrada i objekata”
5113 “Kapitalno odrzavanje zgrada i objekata”
5114 “Projektno planiranje”
5120 “Masine i oprema”
5121 “Oprema za saobracaj”
5122 “Administrativna oprema”
5124 “Oprema za zastitu zivotne sredine”
5125 “Medicinska i laboratorijska oprema”
5126 “Oprema za obrazovanje, nauku, kulturu i sport”
5129 “Oprema za proizvodnju, motorna, nepokretna i nemotorna oprema”
5132 “Ostale nekretnine i oprema “
5151 “Nematerijalna imovina”
5221 “Zalihe materijala”
6216 “Krediti fizickim licima i domacinstvima u zemlji”

A.8 Sampling, Appending and Merging Data across Different Sources

Calculation of different costing scenarios in order to provide universal access to preschool education of children in Serbia in the age group between 3 and 5.5 years took into account all Serbian municipalities for which data from all sources for the three analysed years (2007-2009) are available, such that the working sample of this report is 408 observations (136 municipalities over 3 years). Municipalities which are dropped from the analysis because data from the Treasury on these municipalities were missing in some of the analysed years are: Ada, Dimitrovgrad, Kladovo, Kruševac, Nova Crnja, Nova Varoš, Beočin, Bogatić, Prijepolje, Bor and Zemun (11 municipalities in total). This means that the whole data row on these municipalities is dropped from a merged data spreadsheet and the numbers on these municipalities do not enter any of the performed costing scenario calculations.

Municipality of Belgrade is treated as Belgrade, Zemun, and Lazarevac (i.e., the municipality of Belgrade includes all municipalities but Zemun and Lazarevac), while municipalities of Niš and Kragujevac are treated as one municipality. This has been done in accordance with the availability of the data from the Treasury,

which only reports preschool education expenses at these geographical entities for Belgrade, Niš, and Kragujevac and it does not disaggregate preschool expenditures further.[41] The municipality of Surčin, which in the recent years has appeared as a separate municipality in the DD20 RSO preschool attendance data is treated as part of the municipality Zemun. Municipalities in Kosovo are dropped from the analysis.

Costing of different preschool education scenarios in this report has been performed on data in the period from 2007 to 2009, because of availability of all data sources (i.e., expenditures from the Treasury, demographic statistics, population density, and preschool education coverage) across these three years at the municipality level. Ideally, we would have liked to use the most recent data (i.e., year 2010 or later), but the Treasury data later than 2009 were not readily available. Further, since some municipalities do not show up in the Treasury records in all recorded expenditure categories/years, pooling (appending) the data over three most recent years ensured better data reliability than if we have just focussed on one year (e.g., 2009).

Therefore, in order to create a database necessary for the calculation of different preschool education costing scenarios, we have used the following data sources at the level of municipality, across years 2007 to 2009:

- DD20 RSO data on preschool attendance;
- RSO data on demographic numbers of children in the preschool age cohorts (before the age of 7);
- RSO data on population density;
- Treasury data on preschool expenditures categories.

Data from different sources were first *appended* across the three analysed years (2007-2009). This means that the data base expanded in length, thus adding more observations at the bottom of the database. Taking into account *all* Serbian municipalities for which data from all sources (from Treasury and other sources) for the three analysed years (2007-2009) are available, the working sample of this report is 408 observations (136 municipalities over 3 years).

After appending, data from different sources have been merged in a step by step fashion (i.e., merging DD20 RSO data with the Treasury data, and then merging further with demographic and population density numbers). The process of merging extends the width of the database, thus adding more variables to the right hand side of the database. The merging identifiers are variables YEAR (2007–2009) and MUNICIPALITY (1–136), thus enabling one-to-one (1:1) merging operation in Stata. This means that merging variables uniquely identify each observation in each of the merged datasets.[42]

Further, where appropriate, we have merged different levels of information from DD20 RZS (RSO) (spreadsheets 2 and 3) across different years, in order to, for example, calculate the number of children in the 3 to 5.5 years age category, according to the second definition above. Therefore throughout the

41 For example, in the DD20 RSO data source, Belgrade is separated into Barajevo, Voždovac, Vračar, Grocka, Zvezdara, Zemun, Lazarevac, Mladenovac, Novi Beograd, Obrenovac, Palilula, Rakovica, Savski Venac, Sopot, Stari Grad, Čukarica, and Surčin (separate treatment of Surčin depends on the analysed year and type of data); Niš is separated into Niška Banja, Pantelej, Crveni Krst, Palilula, and Mediana; Kragujevac is separated into Kragujevac — city and Rača Kragujevačka.

42 For more information on merge 1:1 in Stata, see http://www.stata.com/help.cgi?merge.

whole empirical analysis, we kept two separate databases at two different levels (the level of children and type of preschool programme attended and the level of children who attend the PPP programme) in order to use all available information supplied by the DD20 RZS (RSO) data.

Preliminary data manipulations were done in Microsoft Excel (e.g., clean up of Serbian characters and other sorts of data preparation), followed up with a complete data analysis in the econometric and statistic software Stata 12 (StataCorp, 2011).

A.9 Preschool Education Statistics — Some Issues

There are a number of pertinent data issues that need to be discussed at this point.

First, both RSO and MoE cover children in both public and private preschool institutions. Differences in the number of children in preschool institutions reported by the RSO and the ones reported by the MoE could arise because of different time periods when the relevant data are collected. Namely, the RSO collects data at the end of September until the beginning of October, that is, at the beginning of a school year. On the other hand, the MoE collects data in a month of May of the same school year, that is, at the end of the school year. It is possible that at the beginning of a school year not all the children are in preschool records due to different factors (the preschool programme is not organized timely; due to lack of capacities, groups are formed later in the year, etc.).

Problems related to the education statistics identified in the study of Ivić, Pešikan and Jankov (2010) are as follows:

- Some important information is missing (for example, number of children in different PPP and kindergarten groups, disaggregated by gender and type of settlements).
- Lack of data on vulnerable and socially excluded categories of children poses a special problem.
- Education statistics does not follow the changes in the Law on the Fundamentals of the Education System (LFES, 2009).
- Education statistics does not follow the national and international regulations which Serbia takes part in. As a consequence, information necessary to make comparisons with the situation in the EU member countries are often not available. For example, the numbers of 3 year-old and 4 year-old children covered by the preschool education are not available.

These are the reasons why large national surveys have occasionally been used as a source of data in this report, such as the Multiple Indicator Cluster Survey in 2010 (MICS4).

Each year the Government of the Republic of Serbia defines a Plan of Official Statistics based on the previous 5-year programme.[43] The Plan of Official Statistics for 2011 defines statistical report

43 The last 5-year programme was defined for the period 2011-2015.

for preschool institutions which is an extended variant of the previous reports and it will cover the following topics: preschool facilities; form of ownership; the language used for educational work; children by gender and age, children under custody; length of stay during the day and nutrition; parents' participation in the cost of children's stay; teaching a foreign language; children with disabilities — by age, gender and length of day stay and nutrition; number of rejected applications for accommodation of children due to occupancy; implementation of compulsory preparatory preschool program; employees by education level, length of working time, gender and age (Regulation on Plan of Official Statistics for 2011).

Second, it should be noted that DD20 RSO data are collected for the school years, whereas data from all other sources used in this report are collected for calendar years. Because of the latter, we have made an attempt to translate data from the DD20 RSO into calendar years in the following way:

$$dd20\ 2007 = \frac{3}{4} * dd20\ 2006/2007 + \frac{1}{4} * dd20\ 2007/2008$$

where dd20 2007 is data for calendar year 2007 and dd20 2006/2007 and dd20 2007/2008 are data for school years 2006/2007 and 2007/2008 respectively. However, since the dd20 2009/2010 data have different composition of variables in comparison to previous years, we have abandoned this approach. Therefore, all presented calculations in this report are approximate since we essentially used data on preschool attendance measured at academic-year frequencies 2006/2007, 2007/2008, and 2008/2009, but treated them as measures for calendar-year frequencies 2007, 2008, and 2009 respectively.[44]

Alternatively, if calendar-year frequencies (data from the Treasury and the Census) should be recalculated to academic-year frequencies, we would use the following approach:

$$Census\ 2006/2007 = \frac{1}{4} * Census\ 2006 + \frac{3}{4} * Census\ 2007$$

where Census 2006/2007 is data for academic year 2006/2007 and Census 2006 and Census 2007 are data for calendar years 2006 and 2007 respectively. In a similar way, we could 'translate' calendar-year data from the Treasury into academic-year data.

Third, preschool expenditures data from the Treasury show how the money is actually spent. However, these data only show funds received from the Government and "do not account for resources received in other ways including locally-obtained funds, donations of time and in-kind contributions," (Myers, 2008). Capital expenditures in one year should be spread over a number of years and it is difficult to asses how reliable these records actually are. The Treasury does not collect information on initial training and education of teachers. Further, expenditure data from the Treasury (category *duguje*) does not account for resources received by parents, donations of time and in-kind contributions. There is also no item for food and nutrition. From the perspective of this report, one of the biggest drawbacks of the Treasury data is that it does not illustrate expenses per type of preschool (e.g., crèche, kindergarten, and PPP); it only shows overall expenses for preschool education in Serbia per certain expense category.

44 As a robustness check of our results, we could recalculate all numbers based on only two years, 2007 and 2008, which would enable us to translate data from the dd20 source at calendar-year instead of academic-year frequency as well.

Fourth, considering that we do not have preschool attendance data from DD20 RZS (RSO) differentiated by gender for the analysed years (2007-2009), unfortunately we could not perform our analysis separately for boys and girls. However, starting from 2009/2010, DD20 RSO data collects preschool education data differentiated by gender. Since the RSO (Census) already collects demographic numbers of children in the preschool age cohorts (before the age of 7), providing we could obtain more recent Treasury data (i.e., in 2010), in the follow up of this study it would be possible to perform the whole analysis separately for boys and girls in for the year 2010.

SUMMARY STATISTICS BASED ON THE SURVEYED MUNICIPALITIES

We have collected additional data from preschool institutions in 10 sampled municipalities in order to have a better estimate of different categories of actual preschool expenses in Serbia. For this purpose, we have interviewed a director or a principal in 10 kindergartens in municipalities of Ruma (4th quintile), Petrovac (3rd quintile), Užice (5th quintile), Leskovac (2nd quintile), Požarevac (5th quintile), Gadžin Han (3rd quintile), Tutin (1st quintile), Surdulica (1st quintile), Kruševac (4th quintile), and Beočin (5th quintile). The surveyed municipalities have been chosen based on their income quintiles and established contacts with kindergarten institutions in these municipalities.[45] The surveyed institutions provided valuable additional information necessary to complement the main costing exercise based on the Treasury expenditures covering all municipalities in Serbia. Complete questionnaire (in Serbian) is available from the Authors. Summary statistics on collected survey data are presented in Table 31 to Table 36.

Table 31. **Monthly economic cost per child for a full-day preschool education programme for children aged 3–5.5 years**

Year	Obs	Mean	Std. Dev.	Min	Max
2008/2009	8	11717.7	4885.997	2520	19230
2009/2010	9	12749.42	4940.959	3050	19731.2
2010/2011	9	13376.92	4861.789	3480	19731.2
2011/2012	9	13914.84	4902.797	3980	19731.2

Based on information from 9 KG in sampled municipalities, monthly economic cost per child for a full-day preschool education programme for children aged 3–5.5 years was between 11718 dinars in 2008/2009 and 13377 dinars in 2010/2011. Looking at the standard deviation of about 5000 dinars, as well as columns with minimum/maximum (enabling us to calculate the range as a measure of variability), we see that monthly economic cost per child for a full-day preschool education programme for children aged 3–5.5 years significantly varied across the surveyed municipalities.

45 We thank the IMPRES project for kindly providing their contacts with the surveyed institutions.

Table 32. **Monthly economic cost per child for a half-day preschool education programme for children aged 3–5.5 years.**

Year	Obs	Mean	Std. Dev.	Min	Max
2008/2009	4	5252.5	3351.272	660	8700
2009/2010	4	5377.5	3397.454	660	8700
2010/2011	4	5502.5	3461.121	660	8700
2011/2012	4	5752.5	3636.989	660	8700

Based on information from four KG in sampled municipalities, monthly economic cost per child for a half-day preschool education programme for children aged 3–5.5 years was between 5253 dinars in 2008/2009 and 5753 dinars in 2010/2011. Looking at the standard deviation of about 3500 dinars, as well as columns with minimum/maximum (enabling us to calculate the range as a measure of variability), we see that monthly economic cost per child for a half-day preschool education programme for children aged 3–5.5 years significantly varied across the surveyed municipalities.

Surveyed municipalities reported that half-day programmes usually last between 4 and 6 hours (average 5 hours), which coincides with information collected through the dd20 RZS (RSO). Percentage of children aged 3 to 5.5 years in full-day and half-day programmes is 90% and 10% respectively. These numbers are somewhat different from the ones collected through the dd20 RZS (RSO) and do not reflect percentage of children aged 3 to 5.5 years in three-hour programmes. According to the latter source, percentage of children aged 3 to 5.5 years in full-day, half-day and three-hour programmes across the whole of Serbia is 60%, 30%, and 10% respectively. Further, out of 10 surveyed municipalities, 6 confirmed that they do not offer half-day preschool programme for children aged 3–5.5 years.

Table 33. **Preschool expenditures categories which constitute the economic cost per child for a full-day preschool education programme for children aged 3–5.5 years (in 2010/2011 din)**

Expense category	Obs	Mean	Std. Dev.	Min	Max
Teacher salary	8	7716.688	3541.525	2348.2	14112.62
Benefits	8	1304.461	876.0303	0	2800
Bonuses	8	.125	.3535534	0	1
Current expenses: Food & nutrition	8	1758.411	869.0477	477.6	2800
Current expenses: Other	8	2974.43	2835.138	597	9615
Care and preventive care	8	155.4575	167.3527	0	500
Other	8	92.29	143.4753	0	420.09
Other	8	121.6625	328.3274	0	933.5

Table 34. **Preschool expenditures categories which constitute the economic cost per child for a full-day** preschool education programme for children aged 3–5.5 years (in %)

Expense category	Obs	Mean	Std. Dev.	Min	Max
Teacher salary	8	55.4175	13.66353	30	71.52
Benefits	8	9.99	5.79933	0	20
Bonuses	8	.00125	.0035355	0	.01
Current expenses: Food & nutrition	8	12.3	3.638779	8	20
Current expenses: Other	8	19.47125	12.94	8	50
Care and preventive care	8	1.055	1.218946	0	3.6
Other	8	.8025	1.124808	0	3
Other	8	.9625	2.344561	0	6.7

Table 33 and Table 34 show preschool expenditure categories which constitute the economic cost per child for a full-day preschool education programme for children aged 3–5.5 years, in 2010/2011 dinars and their percentages (out of the total economic cost per child), respectively. We see that teachers' salary plus benefits expenses (65%), expenses on food and nutrition (12%), and other current expenses (19%) constitute the largest components of overall preschool expenditures economic cost per child for children aged 3–5.5 years in a full-day preschool education programme. This pretty much coincides with information collected from the Treasury.

In two "other" categories, the surveyed municipalities indicated transport of employees from home to work, professional training, social benefits, services, materials, equipment, and maintenance. Further, most municipalities (eight of them) answered that food and nutrition is never paid separately. Two municipalities responded that food is paid separately if KG is part of the school building (1400 din per month) or if the preschool programme is only half-day programme and away from the main institutional building (650 din per month). Both amounts are in 2010/2011 dinars.

All surveyed municipalities confirmed that reported economic cost per child for a full-day preschool education programme for children aged 3–5.5 years is unique to the whole municipality.

The survey confirmed that the ratio between expenses covered by local Governments and parents is 80/20 (80% is covered by local municipalities and 20% is covered by parents).[46] In addition to this, seven surveyed municipalities responded that parents additionally cover themselves expenses for foreign language classes (e.g., English), theatre, dance lessons, consumables, and/or insurance of children, which are not included in the economic cost per child and which take place during the regular daily activities of the preschool institution.

46 Only in Petrovac this ratio is 71/29 due to the insufficient funds in the municipality budget.

Table 35. **Number of parents who get part or all of the preschool expenses for a full-day preschool education programme for children aged 3–5.5 years reimbursed (in %)**

Reimbursement scale	Obs	Mean	Std. Dev.	Min	Max
Full price	8	66.375	30.86347	1	96
80–99%	7	5.628571	7.049755	0	16.4
60–79%	7	2.371429	3.219583	0	7
40–59%	7	5.857143	8.008924	0	20
20–39%	7	4.571429	9.710083	0	26
1–19%	7	4.857143	12.85079	0	34
Full reimbursement	7	9	11.76152	0	32

Table 36. **Number of parents who get part or all of the preschool expenses for a full-day preschool education programme for children aged 3–5.5 years reimbursed (in numbers)**

Reimbursement scale	Obs	Mean	Std. Dev.	Min	Max
Full price	7	430.8571	389.1861	13	1019
80-99%	7	25.14286	41.85064	0	113
60-79%	7	19.42857	33.58004	0	88
40-59%	6	69.83333	114.3371	0	268
20-39%	7	59.71429	128.0061	0	343
1-19%	7	66.14286	174.9976	0	463
Full reimbursement	7	55	77.73674	0	210

Table 35 and Table 36 show the number of parents (in percentages and number of parents) who get part or all of the preschool expenses for a full-day preschool education programme for children aged 3–5.5 years waived based on different criteria: on the basis of family income, refugee status, a single-parent status, total number of children in the household who are in preschool, a child's illness or special care, a child in a foster care (*"pod starateljstvom"*), etc. According to the collected data, we see that majority of parents (66%) pay the full economic price, 2-5% of parents get part of the price waived, and about 9% of parents receive a full waiver.[47]

Most surveyed municipalities (six of them) responded that there is no precise income scale on the base of which the waiver of preschool expenditures is determined. When further elaborated their answer, municipalities responded that parents coming from low socio-economic backgrounds must submit a waiver request to the municipality council, which is then evaluated and based on this decision, the total preschool expenditures are waived or not.

47 Not all surveyed municipalities were able to answer this question according to the offered reimbursement scale. In Užice, 44% of parents pay only a part of the full economic cost of preschool and in Surdulica more than 90% of parents pay the full economic cost of preschool for children aged 3–5.5 years.

Municipalities which responded that there is precise scale (three municipalities) on the base of which the reimbursement of preschool expenditures is determined said that this scale is determined through the Regulations of Acceptance and Accommodation of Children in Preschool Institutions (Leskovac). In Surdulica parents pay 30-40% less for a third child in preschool and 20% less for a second child in preschool, whereas single parents only pay 50% of the full economic price for preschool. Preschool institutions in Kruševac use the eight-point income scale, which is based on household income per member of household compared to the average net income in Kruševac, such that eligible parents receive an appropriate waiver of the full economic price through child allowances.

When asked how the preschool costs are charged and whether the municipality pays all expenses (maintenance, salaries and meals) and then charges the parents or the payment is organized in some other way, surveyed municipalities mostly replied that the local municipality transfers 80% of the total preschool expenses from the municipality budget into the current account of the preschool institution following the financial plan for current budget year, and the parents pay the remaining 20% of expenses, according to the appropriate reimbursement scale, usually through the bank or a post office.

In additional final comments to the survey on preschool financing in their municipality, the respondent in Požarevac pointed out that the economic price covered by parents was determined in 2009 and it did not change since. The respondent in Tutin commented that the biggest problem was the fact that financial responsibilities between the Republic and the local municipality are not well regulated, specially the financial responsibilities between the PPP and other preschool educational facilities.

TABLES WITH ADDITIONAL RESULTS

Table 37. **Territorial differences at municipality level in terms of preschool coverage and children/group ratio in 2010/2011**

Municipalities	No. of children 3–5 per group	Children/ group ratio (benchmark 21 child per group)	% Coverage for children 3–5.5 years	Enrolment (benchmark 47.4%)
Lower enrolment rates — lower children/group ratio:				
Bač	17.3	Lower	32.0	Lower
Bela Crkva	19.7	Lower	21.9	Lower
Bojnik	16.5	Lower	16.5	Lower
Boljevac	17.5	Lower	26.4	Lower
Bujanovac	17.0	Lower	9.2	Lower
Despotovac	11.7	Lower	31.9	Lower
Doljevac	9.8	Lower	18.0	Lower
Gadžin Han	8.0	Lower	16.5	Lower
Golubac	12.5	Lower	20.7	Lower
Irig	12.6	Lower	40.1	Lower
Kladovo	19.8	Lower	39.9	Lower
Knić	15.5	Lower	18.3	Lower
Koceljeva	20.5	Lower	20.4	Lower
Kučevo	16.0	Lower	20.3	Lower
Lebane	17.3	Lower	17.7	Lower
Ljubovija	11.8	Lower	22.5	Lower
Malo Crniće	10.7	Lower	17.6	Lower
Medveđa	16.5	Lower	21.9	Lower
Merošina	8.5	Lower	5.3	Lower
Odžaci	19.4	Lower	29.3	Lower
Petrovac	18.8	Lower	30.6	Lower
Preševo	7.4	Lower	1.3	Lower
Priboj	18.8	Lower	36.6	Lower
Ražanj	12.5	Lower	33.7	Lower
Rekovac	13.5	Lower	36.2	Lower
Sombor	19.5	Lower	43.8	Lower
Surdulica	13.6	Lower	25.6	Lower
Svilajnac	19.3	Lower	28.3	Lower
Topola	20.0	Lower	27.9	Lower
Varvarin	20.5	Lower	18.4	Lower
Velika Plana	20.0	Lower	31.2	Lower
Veliko Gradište	17.4	Lower	41.9	Lower
Vladičin Han	18.0	Lower	15.2	Lower

Municipalities	No. of children 3–5 per group	Children/ group ratio (benchmark 21 child per group)	% Coverage for children 3–5.5 years	Enrolment (benchmark 47.4%)
Vladimirci	14.5	Lower	14.8	Lower
Žabari	11.3	Lower	23.1	Lower
Zaječar	19.4	Lower	45.0	Lower
Žitište	18.3	Lower	30.4	Lower
Higher enrolment rates — lower children/group ratio:				
Ada	18.3	Lower	71.8	Higher
Bela Palanka	15.8	Lower	50.5	Higher
Čoka	10.5	Lower	80.1	Higher
Kanjiža	19.2	Lower	67.0	Higher
Lapovo	20.5	Lower	51.5	Higher
Mali Iđoš	17.7	Lower	69.5	Higher
Nova Crnja	11.0	Lower	67.9	Higher
Sečanj	14.4	Lower	49.5	Higher
Senta	18.4	Lower	71.1	Higher
Subotica	20.6	Lower	60.2	Higher
Lower enrolment rates — higher children/group ratio:				
Aleksinac	51.0	Higher	20.6	Lower
Alibunar	21.0	Higher	39.8	Lower
Aranđelovac	25.8	Higher	39.3	Lower
Arilje	22.3	Higher	45.0	Lower
Babušnica	28.5	Higher	28.1	Lower
Bačka Palanka	22.1	Higher	36.5	Lower
Bajina Bašta	30.3	Higher	39.4	Lower
BG–Barajevo	26.1	Higher	40.8	Lower
Batočina	23.5	Higher	27.6	Lower
Blace	21.0	Higher	33.6	Lower
Bor	22.8	Higher	30.5	Lower
Ćuprija	24.9	Higher	44.6	Lower
BG–Grocka	27.0	Higher	47.0	Lower
Ivanjica	26.0	Higher	24.2	Lower
Kosjerić	27.0	Higher	26.3	Lower
Kovačica	26.8	Higher	25.4	Lower
Kovin	29.3	Higher	17.2	Lower
Kragujevac	32.0	Higher	43.4	Lower
Kraljevo	29.0	Higher	33.2	Lower
Krupanj	28.0	Higher	12.5	Lower
Kruševac	25.8	Higher	45.5	Lower
Kuršumlija	29.0	Higher	44.3	Lower
BG–Lazarevac	21.7	Higher	39.9	Lower
Leskovac	28.3	Higher	29.0	Lower
Loznica	27.6	Higher	21.5	Lower

Municipalities	No. of children 3–5 per group	Children/ group ratio (benchmark 21 child per group)	% Coverage for children 3–5.5 years	Enrolment (benchmark 47.4%)
Lučani	22.0	Higher	39.1	Lower
Majdanpek	21.0	Higher	28.6	Lower
Mali Zvornik	23.5	Higher	25.1	Lower
BG–Mladenovac	22.6	Higher	44.3	Lower
Negotin	25.0	Higher	37.2	Lower
Nova Varoš	22.5	Higher	20.0	Lower
Novi Bečej	27.0	Higher	39.6	Lower
Novi Pazar	32.5	Higher	12.8	Lower
BG–Obrenovac	24.0	Higher	41.6	Lower
Opovo	22.0	Higher	27.5	Lower
Osečina	26.3	Higher	33.1	Lower
Pančevo	26.9	Higher	44.3	Lower
Paraćin	26.0	Higher	29.7	Lower
Pirot	27.8	Higher	34.3	Lower
Prijepolje	21.2	Higher	22.0	Lower
Prokuplje	27.8	Higher	18.3	Lower
Rača	22.4	Higher	44.3	Lower
Ruma	22.0	Higher	32.9	Lower
Šabac	25.2	Higher	32.8	Lower
Sjenica	35.5	Higher	8.3	Lower
Smederevo	23.2	Higher	34.1	Lower
Smed. Palanka	23.3	Higher	39.7	Lower
Svrljig	29.0	Higher	34.5	Lower
Titel	27.7	Higher	33.1	Lower
Ub	28.3	Higher	25.8	Lower
Vlasotince	29.8	Higher	25.2	Lower
Vranje	28.5	Higher	33.3	Lower
Vrnjačka Banja	27.0	Higher	39.9	Lower
Vršac	24.5	Higher	42.9	Lower
Žabalj	26.2	Higher	44.0	Lower
Žagubica	23.0	Higher	32.8	Lower
BG–Zemun	26.7	Higher	47.2	Lower
Higher enrolment rates — higher children/group ratio:				
Aleksandrovac	21.0	Higher	58.0	Higher
Apatin	25.8	Higher	57.0	Higher
Bačka Topola	25.1	Higher	54.5	Higher
Bački Petrovac	21.8	Higher	75.2	Higher
Bečej	24.7	Higher	65.1	Higher
Beočin	24.8	Higher	47.9	Higher
Brus	29.3	Higher	53.8	Higher
Čačak	29.5	Higher	58.0	Higher

Municipalities	No. of children 3–5 per group	Children/ group ratio (benchmark 21 child per group)	% Coverage for children 3–5.5 years	Enrolment (benchmark 47.4%)
Čajetina	23.3	Higher	71.2	Higher
Ćićevac	26.0	Higher	61.9	Higher
Čukarica	25.8	Higher	62.9	Higher
Dimitrovgrad	21.0	Higher	67.3	Higher
Gornji Milanovac	26.6	Higher	63.5	Higher
Inđija	26.4	Higher	63.8	Higher
Jagodina	23.6	Higher	47.6	Higher
Kikinda	26.8	Higher	61.1	Higher
Knjaževac	32.5	Higher	62.1	Higher
Kula	25.2	Higher	60.6	Higher
Lajkovac	31.0	Higher	57.8	Higher
Ljig	25.7	Higher	48.9	Higher
Mionica	22.2	Higher	53.5	Higher
Nis	27.9	Higher	49.0	Higher
BG–Novi Beograd	22.4	Higher	77.3	Higher
Novi Kneževac	25.3	Higher	63.9	Higher
Novi Sad	28.4	Higher	94.2	Higher
BG–Palilula	25.2	Higher	52.8	Higher
Pećinci	28.0	Higher	66.5	Higher
Plandište	21.3	Higher	75.4	Higher
Požarevac	25.0	Higher	51.6	Higher
Požega	24.5	Higher	53.1	Higher
BG–Rakovica	28.8	Higher	64.1	Higher
Raška	28.3	Higher	57.6	Higher
BG–Savski Venac	22.4	Higher	145.7*	Higher
Šid	24.8	Higher	55.8	Higher
Sokobanja	24.5	Higher	50.8	Higher
BG–Sopot	23.8	Higher	47.5	Higher
Srbobran	33.7	Higher	51.6	Higher
Sremska Mitrovica	24.8	Higher	49.0	Higher
Sremski Karlovci	27.0	Higher	86.7	Higher
Stara Pazova	28.1	Higher	58.2	Higher
BG–Stari Grad	22.9	Higher	104.3*	Higher
Temerin	26.5	Higher	55.7	Higher
Trstenik	21.2	Higher	55.2	Higher
Užice	35.6	Higher	59.8	Higher
Valjevo	26.8	Higher	48.2	Higher
BG–Voždovac	25.4	Higher	60.8	Higher
BG–Vračar	22.5	Higher	116.7*	Higher
Vrbas	22.1	Higher	56.6	Higher
Zrenjanin	30.0	Higher	52.1	Higher

Municipalities	No. of children 3–5 per group	Children/ group ratio (benchmark 21 child per group)	% Coverage for children 3–5.5 years	Enrolment (benchmark 47.4%)
BG–Zvezdara	23.8	Higher	66.0	Higher
Bosilegrad	0.0	–	18.3	Lower
Trgovište	0.0	–	24.9	Lower
Tutin	0.0	–	3.0	Lower
Crna Trava	0.0	–	51.2	Higher
Bogatić	0.0	–	0.0	–
Žitorađa	0.0	–	0.0	–

Notes: In three Belgrade municipalities (Vračar, Savski Venac, and Stari Grad) the PE enrolment rates were higher than 100%. These are central urban municipalities and many parents, who live in some other but work in these municipalities, bring their children to the kindergarten nearby their place of work. In 2010-2011, in Bosilegrad, Trgovište, Tutin and Crna Trava there were no children from 3 to 4 years or from 4 to 5 years enrolled into PE. In the same school year, in Žitorađa and Bogatić there were no children between 3 and 5.5 years enrolled in into PE.

United Nations Children's Fund
Svetozara Markovica 58
11000 Belgrade
E-mail: belgrade@unicef.org
Web site: www.unicef.org/serbia
www.unicef.rs