

Investing in Early Childhood Education in Serbia

Belgrade
September, 2012

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This Booklet is based on a full Technical Report: “Investing in Early Childhood Education in Serbia — Costing models for ensuring preschool education for all” which is available on www.unicef.org/serbia/

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This initiative and report would not have been possible without the support of the European Commission.



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.

INTRODUCTION

For almost a decade now, preschool education in Serbia has been recognized as a necessary factor for solving the problems of poverty and social exclusion. The National Millennium Development Goals (NMDG, 2006) specify that by 2015, 70% of children from 3 to 7 years old should be in preschool education, with a special focus on children from marginalized groups. The NMDG (2006) also include a plan to double the number of preschool institutions, with uniform geographical distribution. Further, the draft National Strategy of Education Development in Serbia covering the period until 2020, which includes preschool education, envisages that by 2020, 75% of children from 3 to 5.5 years old should be in preschool. Currently, coverage with preschool education of children from 3 to 5.5 years is very low, especially for children from vulnerable groups and calls for immediate action.

UNICEF, in cooperation with the Ministry of Education, Science and Technological Development, has studied the financial feasibility and developed costing models for ensuring preschool education for all 3 to 5.5 year old children in Serbia.

THE IMPORTANCE OF PRESCHOOL EDUCATION

Preschool education serves two main functions. First it promotes children's early development, which will also have positive benefits to the nation; and second it enables parents to engage in the labor market or continue with education while children are cared for in kindergarten. Currently, in Serbia, this second function tends to determine access to preschool.

The benefits, to both the state and individuals, arising from early childhood education are backed by solid economics, and explained by advancements in brain research.

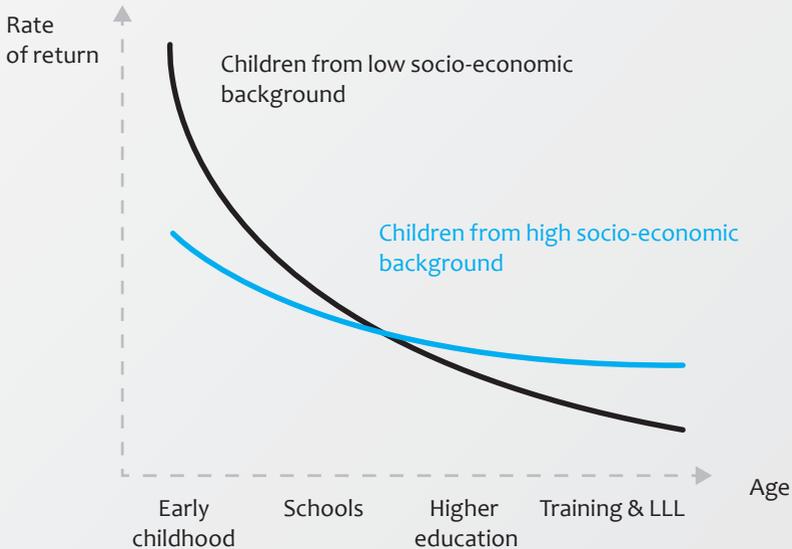
To begin with the economic case, the gains from early learning take many forms. Firstly, children perform better in education. In the short term this saves costs by reducing school drop-out and grade repetition. In the longer term it improves educational attainment and achievement, as evidenced by results from the international PISA¹ survey (see Box 1). Secondly, children's health improves — an effect that carries through to later life — with intrinsic benefits to the child and a reduction in governmental spending on health care. Thirdly, children are less likely to become involved as adolescents or adults in criminal and other dysfunctional behavior. Finally there are wider socio-economic returns: unemployment rates go down and average income goes up, leading to less spending on social benefits and more tax revenues for the state.

1 OECD Programme for International Student Assessment

Box 1: Evidence from PISA. According to PISA data for European countries, the effect of preschool education on student achievement, measured through 15-year-old school pupils' scholastic performance, in reading is 25 points higher for pupils who attended preschool for more than 1 year in comparison to those who have not attended preschool (Haahr et al., 2005). In a recent paper by Vujić and Baronijan (2011) based on PISA data for Serbia, in a sample of male pupils the positive effect of preschool attendance on school performance disappears once the authors control for factors of socio-economic background. In a sample of female pupils, the positive effect of preschool attendance on school performance remains significant even after the authors control for factors of socio-economic background and is 27 (mathematics), 15 (reading), and 14 (science) points higher for female pupils who attended preschool for more than 1 year in comparison to those who have not attended preschool.

Figure 1 shows the so-called Heckman curve. This Nobel Prize Laureate economist found that investment in learning in the early years yields much higher returns than learning later in life. This graph illustrates that the effect is stronger for children from low socio-economic backgrounds (green line), than for the more privileged children (red line). A child of two well-educated working parents is more likely to have a stimulating home environment, with lots of toys, books and communication media. These parents are more likely to provide that child with a rich vocabulary and a good basis for further learning. Enrolling this child from a young age in full-time daycare (with very high costs) is unlikely to stimulate child development much further than would have been the case in the home environment. By contrast, when the home environment is lacking stimuli and parents — especially the mother — have a low level of education, then preschool attendance of three or four hours per day can have a significant impact on child development, and at much lower costs.

Figure 1: Early learning has the largest impact, especially for the poorest



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

Overall, investment in early learning will eventually lead to a return that is equal to 17 times the initial investment, according to a 2007 article in the leading medical journal, *The Lancet*.

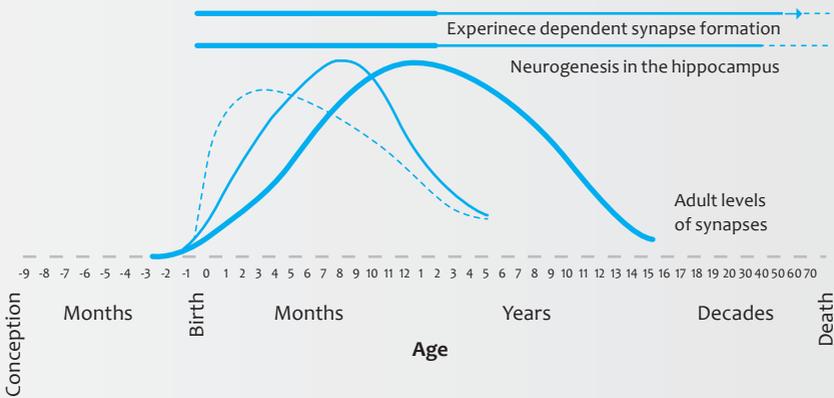
The reasons why investments at an early age are so effective are becoming clearer with advances in brain research. Figure 2 shows the pattern of brain development from conception to age 16 for three main functions: seeing and hearing (dotted line), language (thin line), and higher cognitive functions (bold line). To be clear: this concerns the development of the brain's

capacity to acquire certain skills, not these skills as such. For example, while language acquisition can continue throughout childhood, adolescence and even adulthood; the peak of the language curve in the figure indicates the period in which the brain is most sensitive to the formation of the relevant synapses. It is the foundation. It is the unique period in which the brain develops the basis for further learning throughout life.

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

Time courses for synapsogenesis

- Higher cognitive functions (prefrontal cortex)
- Receptive language area / speech production (angular gyrus Broca's area)
- - - Seeing / hearing (visual cortex / auditory cortex)



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

The bold line — indicating higher cognitive function — peaks around the preschool years. It is already on the decline upon entry into primary school, and by the age of 15 it approaches zero. Again, 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 helps illustrate that academic achievement and early school leaving are best tackled during the preschool years, and at much lower costs than later interventions. If Serbia's economy requires that higher education is expanded beyond a privileged group, one of the strategies will have to be universalizing preschool education.

Figure 2 also illustrates that synapse development picks up in the last months of pregnancy, with the curves for sensing and for language already peaking in the first year of life. It would be wrong to conclude from this that children should already enroll in preschool at that age. By age 3, spontaneous child development processes are connected with socialization needs, meaning that children benefit from quality preschool programmes. Children below that age are best educated in the home environment.

From a child development perspective, short programmes of good quality of three or four hours per day, five days per week have proven to be sufficient as long as children start at the age of three. The daily interchange between time spent in a kindergarten, time spent playing with peers and time in the home environment brings a stimulating variety of learning experiences. The short duration (in years and in hours per day), as well as the absence of meals and sleeping facilities, result in a significant difference in costs compared to, for instance, full-day kindergarten (nine hours) for children from age 1 to age 7.

PRESCHOOL COVERAGE: CURRENT STATUS

Compulsory, free Serbian schooling starts with the Preparatory Preschool Programme (PPP) currently covering approximately 90% of children aged 5.5 to 6.5.²

The target group of the Technical Report are those children between 3 (the age at which preschool programmes become most beneficial) and 5.5 years old, when they are eligible to enter PPP. Currently 48% (84,000 out of 177,000) of 3 to 5.5 year olds are enrolled in kindergarten³, while 93,000 children of the same age are not in any preschool programme. The draft National Strategy of Education Development for 2020 has set an enrolment target of 75%, which would require an increase of about 40,000 places.

The enrolment rate is on an upward trend; today it is about 25% higher than it was in 2005. Yet, looking at the *absolute* numbers of enrolled children, very little growth can be observed in the same period, with a decline between school years 2009/2010 and 2010/2011. Figure 3 presents this trend for various age groups.

- 2 Reaching full enrollment at this level should not require substantial amounts of money, but it may require greater attention. The experience worldwide with universalizing educational programmes is that the last 10% are the hardest to reach. Many of the children who are still excluded may belong to disadvantaged minorities, live in remote impoverished areas, or are affected by urban poverty. An additional problem is that when as many 90% of children do attend PPP, this will influence teaching practices in the lower grades of primary education. Officially or unofficially, the curriculum and the pedagogy will be tuned to the level of the children who attended PPP, entrenching disadvantages.
- 3 The common terminology for programmes provided for those aged 3 to 5.5

Figure 3: Trends in absolute numbers of enrolled children for various age groups, 2006–2011

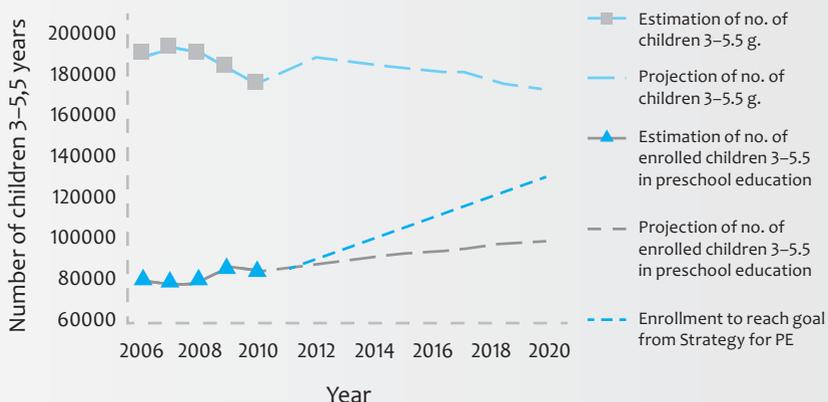


Sources and notes: Technical Report

Apparently, the increase in the enrolment rate is caused by a decrease of the number of children aged 3 to 5.5 years, rather than an increase of preschool capacity. Due to the low fertility rate, this trend is likely to continue. Figure 4 shows the trends (beyond 2011 projections are used) of both the total number of children in the relevant age bracket (blue) and the number of enrolled children (pink). The figure shows that the two lines continue to converge, but they converge very slowly. Even in 2020 there is a gap of about 75,000 excluded children. The green line symbolizes the increase in

preschool capacity that is needed to achieve the target of 75% enrolment by 2020 (draft National Strategy of Education Development).

Figure 4: Population and enrolment trends/forecasts concerning 3–5.5 year olds



Source: Technical Report

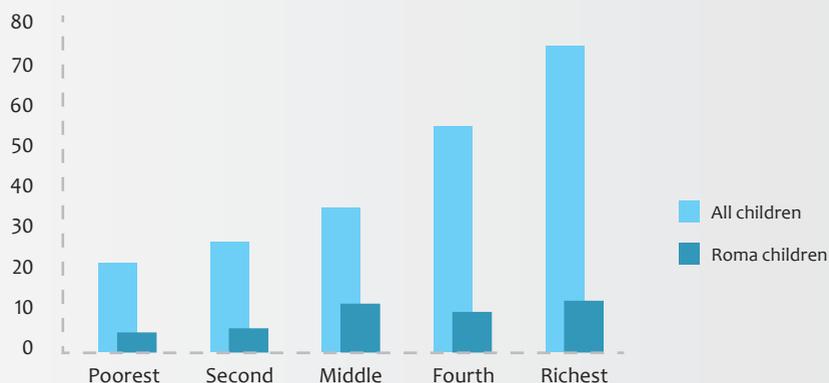
Of the children currently in kindergarten approximately 62% of them are in the full-day programme and another 30% attend the so-called half-day programme. Only 7% of the enrolled children of 3 to 5.5 years old are in three-hour programmes designed for child development rather than daycare. It is clear from the data that parents are using kindergarten primarily as a childcare service. This is particularly visible in urban areas with high rates of employment, where there is an insufficient supply of preschool spaces

available to working parents. On the other hand, most of those parents who have home-based child care available (grandparents, babysitters, etc.) do not enroll their children. The first group of parents faces a lack of supply whereas among the second group there is a lack of demand. Parents' awareness of the benefits of early education must be addressed.

Disparities in Coverage

As previously noted, the benefits of enrolment are the highest among the more disadvantaged groups, however, the latter are in reality under-represented. Figure 5 shows how access among the richest 20% of the population is over three times higher than among the poorest 20%. For Roma children, access is extremely limited, almost regardless of income.

Figure 5: Preschool access at age 3 to 5 by wealth quintiles (2010)

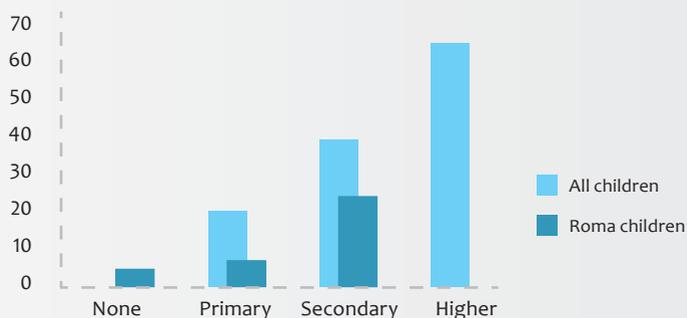


Source: Multiple Indicator Cluster Survey (MICS4), UNICEF, 2010

Moreover, in rural areas, access is about half of that in the cities: 28.7% versus 56.6%. Among Roma, 10% of urban children are enrolled, against a mere 4.1% of those living in the countryside. Children with disabilities are under-represented as well. While about 5% of the children in this age group have a disability, only 1.2% of enrolled children are those with disabilities.

Another important disparity concerns the education level of the mother. Analyses of education achievement — e.g. based on PISA and similar studies — have consistently indicated that the education level of the mother is the single most important factor to predict school success. Its impact even exceeds that of school-related factors such as curriculum, teacher quality and class-size. Child-rearing practices during the earliest years drive cognitive development, for better or worse (see Figure 2 above). What would be most desirable from both a child development and economic perspective is that preschool access is highest for children whose mothers have lower education levels. Unfortunately, as figure 6 shows, precisely the reverse is the case.

Figure 6: Preschool access at age 3 to 5 by level of education of the mother (2010)

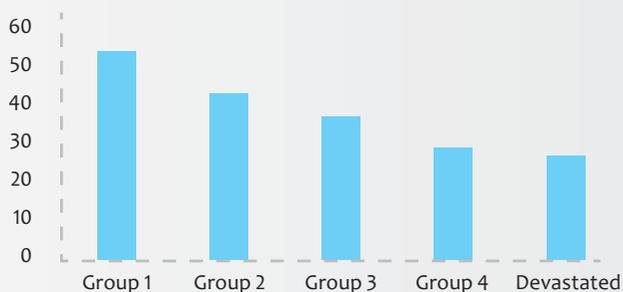


Source: Multiple Indicator Cluster Survey (MICS4), UNICEF, 2010

The causes of the correlation between preschool access and maternal education are not clear. It could be a matter of better awareness of more educated mothers about the importance of preschool. Alternatively, it could be a result of the fact that better educated mothers are more likely to have a job and to be in need of childcare. Whatever the cause, the pattern in figure 6 is in contradiction with the needs of children.

Since preschool education is the responsibility of municipalities, it is also important to examine possible correlations between preschool access and relevant background variables at the municipal level. It is likely that some municipalities are home to more poor and low-educated parents than others, and that this influences preschool enrolment. Figure 7 confirms this by demonstrating that municipalities with the highest level of development (group 1) have the highest enrolment rates, while the least developed municipalities have much lower rates.

Figure 7: Preschool enrolment age 3 to 5.5 in municipalities by level of development (2010)



Source: Multiple Indicator Cluster Survey (MICS4), UNICEF, 2010

The categorization used in figure 7 is based on a composite indicator which is determined by municipalities' income and budgets; the growth or decline of their populations; their unemployment rates; their inhabitants' education levels; and the presence of urban areas within the municipality. Several of these underlying indicators are very relevant to preschool. For example, the education level of parents co-determines the need for child preschool programmes, as we have seen above. And population density influences costs; in sparsely populated areas, preschools will have smaller class groups and/or invest more in transportation and mobile services. Hence, this categorization of municipalities by level of development could be a basis for differentiated or targeted support with a view to increase enrolment equitably.

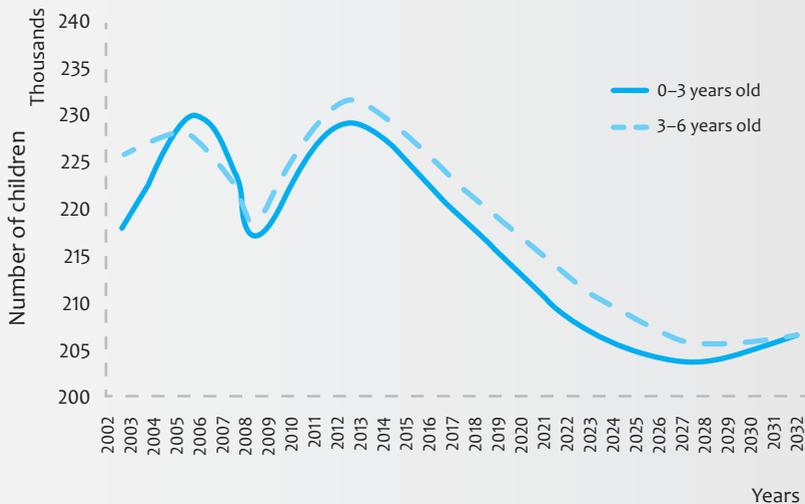
FINANCIAL IMPLICATIONS OF EXPANDED PRESCHOOL COVERAGE

Calculating the Costs

In Serbia, the cost of enrolling one child for one year in a full-day programme is about €1500. This includes only recurrent costs such as salaries, utilities and food; investment costs (e.g. space, inventory) will be dealt with later. The unit cost of a short 3 to 4 hour programme could not be assessed directly. However, calculations and estimations in the Technical Report indicate that the unit cost of a 3 to 4 hour programme is at least three times lower than that of a full-day programme, and possibly up to six times lower. From this it can be concluded that it costs a maximum of €500 to enroll a child for one year in a 3 to 4 hour programme, and possibly less.

If this unit cost of €500 is multiplied by 93,000, (the number of Serbian children aged 3 to 5.5 years who are not currently in preschool), an additional €46 million would be required for annual recurrent costs. To enroll initially just the 4–5.5 year olds would cost €26 million annually. Adding the 3–4 year olds at a later stage would cost the remaining €20 million per year. In reality the costs may well be lower, for two reasons. First, as already mentioned, the unit cost of €500 for the 3 to 4 hour programme may be over-estimated. Second, the number of children in the relevant age bracket should decrease by about 10% in the coming 15 years, as figure 8 suggests.

Figure 8: Estimated number of 0–3 and 3–6 year olds in Serbia to 2032



Source: Technical Report

Sharing the costs

In Serbia, the costs of preschool education are normally shared between municipalities who pay 80% of the price, and parents who pay a fee which covers 20%. There are strong reasons not to apply this principle for the 3 to 4 hour programme. Crucial for children and for society, the short programme is a core social service for which no fee should be charged. It should be accessible to all. For comparison purposes, for a child who spends 4.5 years (from age 1 to 5.5) in a full-day preschool programme, the Government pays €5,400 (4.5 times 80% of €1500). On the other hand, for a child who spends 2.5 years (from age 3 to age 5.5) in a 3 to 4 hour programme, Government pays a maximum of €1000.

However, if the entire burden of the estimated €46 million would rest on the shoulders of local governments, there is a risk that the less developed municipalities will be unable to mobilize the necessary resources. This could cause existing geographical disparities in coverage to be continued or even exacerbated.

One solution would be for the national Government to provide a differentiated per capita subsidy. For example, the national Government could cover 20% of the costs of the 3 to 4 hour programme for every child that lives in a municipality in groups 2, 3 and 4, whereas no subsidy would be provided to municipalities in group 1. Together, the municipalities in groups 2, 3 and 4 are home to about 65,000 of the 177,000 children of 3 to 5.5 in Serbia. So the annual costs for the national Government would amount to €6.5 million (65,000 times 20% of €500). This is still a small share of the total costs of €46 million, but more ambitious schemes are possible as well. For example, the national Government could subsidize children in group 2 for 20%, in group 3 for 40%, and in group 4 for 60% of costs. This would roughly double the burden of €6.5 to about €13 million. Table 1 summarizes these outcomes.

Table 1: Two schemes for differentiated subsidies and their costs for the national Government

	Group 1	Group 2	Group 3	Group 4	Costs
Scheme 1	0%	20%	20%	20%	€6.5 million
Scheme 2	0%	20%	40%	60%	€13 million

Covering the costs

To put these costs into perspective, it can be noted that Serbia is currently (in 2012) spending about €150 million annually on preschool education, and that an economic growth rate of 3% is forecasted for 2013. This means that even if Serbia does not increase preschool spending as a share of GDP, the budget should grow by about €4.5 million. This may not immediately be sufficient to cover, for instance, the required €6.5 million in Scheme 1, but in addition, every subsequent year will see a budget increase as long as there is economic growth. The figure of €6.5 million, on the other hand, is structural. So for instance, after two years of 3% GDP growth, Serbia can easily cover the required €6.5 million in Scheme 1, while after three years of such growth it can make the more ambitious Scheme 2 a reality. Even more resources could be mobilized if Serbia would gradually increase (within a few years' time) preschool spending from the current level of 0.43% of GDP to the OECD average of 0.50% of GDP. This increase of 0.07% of GDP for preschool education translates into about €25 million.

Another potential source of resources to co-finance the 3 to 4 hour programme could be from efficiency gains in existing preschool programmes in Serbia. The full-day programme cost of €1500 equals

nearly 30% of per capita GDP, which is relatively high in an international perspective. This could be caused by inefficiencies such as over-staffing. Further research would be needed to shed more light on this, but as an indication even a mere 10% savings in the annual costs of full-day programmes yields more than €10 million annually.

Another option would be to raise the fee in the full-day programme on the grounds that families who have access to this programme receive a substantial subsidy for a service that only partly serves the public cause. Various scenarios are possible. For instance, raising the fee from the current level of €25 to €30 per month (i.e. a 20% increase) would bring about €5 million per year, whilst raising the fee to €35 (i.e. a 40% increase) would yield €10 million. Table 2 gives an overview of these and other measures.

Table 2: Strategies to mobilize the necessary resources

Optional measures	Effects of these measures on the preschool budget
Budget keeps pace with GDP growth	An annual preschool budget increase in the order of €5 million, assuming 3% economic growth
Budget is increased as a share of GDP	A structural budget increase in the order of €25 million, if the budget would grow from 0.43% to 0.50% (OECD average)
Reduce inefficiencies in the full-day programme	A structural budget increase of €10 million, assuming a reduction of annual spending on full-day by 10%
Raise the fee in the full-day programme	A structural budget increase of 5, 10 or 15 million euro, if the full-day fee were raised by 20%, 40% or 60%

Finding the Space

Finally, demographic developments can play a role in covering the costs of the 3 to 4 hour programme. Figure 8 already showed the decline in the number of children aged 0 to 6. But primary and secondary education, too, will see enrolment stabilise at lower levels than in the past, as the large age cohorts born in the 1990s move out of the education system. This may make classroom space available for the 3 to 4 hour preschool programme within existing schools. To enrol all excluded children in the 3 to 4 hour programme, 4,500 groups of 21 children must find a place somewhere. The most efficient way would be to have three shifts in one classroom (from 8 o'clock in the morning to 5 o'clock in the afternoon), requiring 1,500 classrooms, whereas in a two-shift system this number would be 2,250.

To what extent available space in primary schools can cover this, is difficult to say as it depends on local circumstances. The demographic decline in Serbia goes hand in hand with migration from rural to urban regions, so some regions actually face population growth. But on a case by case basis the demographic impact can be assessed locally. Moving PPP to primary schools could be an additional or alternative strategy to find the space for the 3 to 4 hour programme — this measure would cover more than two-thirds of the space needed. Likewise, filling up unused space in kindergartens can create 1,022 places in 3 to 4 hour programmes, whilst the use of community spaces is also an option. Construction of new buildings would be the most costly solution.

The help of national and international NGOs and private sector organizations is deemed defensible to cover start-up costs, such as those of refurbishing and equipping classrooms. But the recurrent costs should be borne and secured by authorities. The Technical Report has firmly demonstrated that this is possible.

CONCLUSIONS AND RECOMMENDATIONS

The introduction of a universally accessible 3 to 4 hour preschool education programme for all children aged 3 to 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, labor productivity and even the nation's prosperity and competitiveness in the long run, as shown by the research and analysis detailed in the Technical 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 enrollment 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 from locations with the highest need (i.e. 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 the principles of social justice and equitable distribution of 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

- ▶ **The 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 the 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 national 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 the value of preschool education for the 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 analyzed.** 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 analyzed to determine the extent to which further decreases in the number of children will free primary school capacities and leave space for their utilization for preschool programmes.

Specific Recommendations

- ▶ **The introduction of a universally accessible 3 to 4 hour preschool education programme for all children aged 3 to 5.5 years 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 to 4 hour programmes should be free of charge and available to all children 3 to 5.5 years old. The gradual introduction of this provision, first for children 4 to 5.5 years old and then for those 3 years old, would decrease the pressure both on physical capacities for preschool and additional resources needed.
- ▶ **3 to 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 program, and as shorter day programme has significantly lower costs, 3 to 4 hour programmes have the most favorable cost-benefit ratio. The large proportion of children currently attending full-day programmes is doing so for custodial, rather than educative reasons.
- ▶ **Enrollment of all children that are currently out of preschool education into 3 to 4 hour programmes would require investment of maximum 46 million EUR.** The cost of the 3 to 4 hour free of charge programmes for all children 3 to 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, Science and Technological Development 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 the share of full-day costs paid by parents, based on their wealth status.



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