

REGIONAL DIFFERENCES IN THE EDUCATIONAL INFRASTRUCTURE – CHANGES AND CHALLENGES

The current study is dedicated to the research of the differences in regional aspect in the development of educational infrastructure (by region and districts), which give a chance to evaluate the access to education at different levels. For this purpose, choice of indicators that reflect the coverage of the population on a different level of education have been made. As a result of the comparative assessment of the differences in the educational infrastructure between Bulgaria and the EU countries, it is found that at all levels of education there are positive changes, as on some indicators Bulgaria achieves/exceed the corresponding values of countries with closer or higher social-economic development. Detailed analyzes were conducted to identify regional differences in the access of children/students to pre-school and school education. An adequate place is given to the problem of drop-outs as a factor for reducing student coverage.

JEL: H75; R58; I21; I25

Introduction

The development of the education system, and mainly all of its institutional infrastructure, largely determines the changes in the indicators of the level and quality of life of the population. Between these two spheres, there are direct and feedback links that reveal the real interactions that guide the identification of the priorities and policies to refine them. Of specific scientific-practical importance is the research of the impact of education on the standard of living in territorial aspect – by regions and districts of the country. This approach opens up opportunities for efficient distribution of the investment, resulting in the multiplication of effects both in education and in the field of the living level of the population.

In view of these statements, the **main purpose** of the study is formulated: to determine the educational indicators that most strongly affect the level and quality of life of the population in Bulgaria; to identify territorial differences and inequalities, especially in terms of population coverage in the education system.

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The **subject** of this study is the analysis and assessment of regional differences, ranked at different levels of education – pre-school, school and higher education.

The specific **research tasks** are derived from the main purpose and the subject of the study:

- Selection of indicators for measuring the impact of educational institutional infrastructure on the level and quality of life of the population;
- Detecting of the territorial differences by region and district at different levels of education;

The development of the education system and, above all, its institutional infrastructure largely predetermines changes in indicators of the level and quality of life of the population. There are also links between these two areas, which reveal the real synergies that define priorities and policies for their improvement. With particular scientific and applied importance is the study of access to education in a territorial aspect – by regions and areas of the country. This approach reveals opportunities for efficient distribution of investments, as a result of which aggregate effects multiply both in education and in the area of living level of the population.

From the point of view of these productions the **main purpose** of the survey is formulated: to define the indicators of education that most reflect on the level and quality of life of the population in Bulgaria; To reveal territorial disparities and inequalities, particularly as regards the extent of the population in the education system; **Selection of indicators for educational infrastructure and population coverage by the degree of education.**

Indicators in the sphere of pre-school education

Pre-school education is increasingly being formed as a significant basis for achieving a smooth transition to the actual school education. The education of children from an early age determines the quality of the construction of the "first seven years" – an important prerequisite for the level of education in higher education levels.

The adopted Pre-school and School Education Act (in force since 01.08.2016) provides for relevant tasks, measures and modules for the achievement of effective and modern education, which would create the conditions for raising and improving the structure of the employment and income of the Bulgarian families. Only through a qualitative and complete educational process from its pre-school stage, it is possible to provide individual development for each child/pupil in view of the set parameters of a flexible and adequate system of pre-school education. It must be based on the new expectations and requirements for its improvement, in line with societal changes and needs for a higher and quality standard of living.

In the context of these productions, there is a need for a justified choice of pre-school indicators, through which to the highest degree to determine the educational infrastructure in the territorial aspect per regions and per districts of the country, as well as the extent of the population in the pre-school form of education.

The National Statistical Institute conducts annually comprehensive statistical surveys characterizing the activities of educational institutions in Bulgaria, the information being systematized in two sections: "Overview" and "Regional review". In the case of pre-school institutions, the study concentrates on problems, respectively indicators related to kindergartens (educational level MSKO-O). These institutions are the sources of information for children behaved and educated in them. The main statistical characteristics of the number of kindergartens are divided into two groups: in the form of ownership (public and private) and by type – all-day, a half of day, seasonal and kindergartens/groups for children with special educational needs.

As statistical units are determined the number of children in kindergartens, as well as the number of kindergartens. These so-called "statistical units" possess statistical significance, but from the point of view of the purpose and objectives of the present study, they do not provide information on the degree of sufficiency of the educational infrastructure in relation to kindergartens, i.e. they do not contain information about the scope of pre-school children in the kindergarten system. Similar is the nature and the derived from them indicator "average number of children in a kindergarten". Although it refers to the "average number of children", a number of questions immediately arise such as: "what kind of kindergarten", "with what number of places", "with what area and architecture", etc.

It is clear that such indicators are not suitable for use for comparative analyses and evaluations, as the purpose of this study is. Moreover, where the primary objective concerns the study of links and interactions between education and the level/quality of life.

Obviously, in this case, the indicators that can measure the scope or access of children to pre-school education are the most appropriate. For this purpose, the NSI calculates the internationally agreed general indicator "degree of participation of the population in the education system". Its essence consists in the calculation of the relative share of the enrolled children/students of a certain age group to the number of the permanent population of the country of the same age group. This means that the number of enrolled children/students should be established annually, not the number of entries. For pre-school education, the group net enrolment rate of children in kindergartens is calculated as a percentage as regards the number of children in kindergartens in the age group 3-6 years to the number of population in the same age group. This statistical indicator reflects the scope of children in the age group 3-6 years in educational institutions of pre-primary education. Analyses of its territorial values show the respective differences between territorial units in terms of the scope/access of children in pre-school education.

In addition to this indicator, important information is obtained from the use of the indicator "places in kindergartens of 100 children", which reveals the degree of assurance with services of childcare facilities. With a value of this indicator above 100, a certain excess assurance is found, while the values below 100 signal a shortage of places in kindergartens.

As a result of the substantiated choice of indicators for analysis and evaluation of pre-school education in terms of its impact on family living and quality of life, the following indicators are proposed:

"Net enrolment rate of registration in the kindergartens of children of the age group 3-6 years by region and district";

"Places in kindergartens of 100 children of the age group 3-6 years by region and districts".

Indicators in the sphere of school education

The school education as defined by the NSI includes the following degrees of education and their respective educational institutions:

- Primary and high schools education;
- Secondary education in all types of schools;
- Vocational training after secondary education in vocational colleges.

The main statistical units (indicators) are the number of enrolled pupils/students in the different grades of education in the age groups between 7 – 19 years of age. Accordingly, schools are covered by the following statistical units:

- Elementary (I-IV grade);
- Primary (I-VIII class);
- Junior high schools (V-VIII class);
- Gymnasiums (IX-XII or VIII-XII class);
- Secondary general education (I-XII grade);
- Vocational gymnasiums (VIII-XII class).

Similarly to the approach taken in pre-school education, it is appropriate to use the internationally accepted indicator "the level of participation of the population in the education system". It is calculated as the relative share of enrolled students of a certain age group to the number of permanent population of the country of the same age group. It is obviously possible to calculate such indicators for the six levels of school education indicated. However, this disaggregated structure would make it difficult both to calculate and to carry out appropriate analyzes and evaluations, especially in the territorial aspect by regions and districts.

These indicators de facto measure the coverage of students in the school system through the net enrollment rate. For the purposes of this study, it is most appropriate to use the relative proportions of students enrolled in schools in the aggregate age group of 7-19 years to the population of the same age group.

Of great importance is the issue of reducing the scope of students as a result of dropping out of school. It is appropriate to profile the relevant indicators by levels of education, reasons for leaving and in regional aspect.

In a conclusion of the assessments made for the expediency of the possible indicators as the most acceptable are the following:

"Net enrollment rates of students in all schools incl. Professionals from 7-19 age group, per region and districts."

"Students leavers per groups of classes, reasons for leaving and per region and district."

Indicators in the sphere of higher education

The main statistical units (indicators) for higher education are the number of students enrolled in total, as well as by type of higher education in the 20-24 age group. Similar to the fields of pre-school and school education, and in the field of higher education, the most significant are the relative proportions of enrolled students in the age group of 20-24 years to the population of the country of the same age group. According to the purpose of this study, they are calculated, analyzed and evaluated in territorial aspect by region and region. In this way, the relevant net enrollment rates are determined, based on which specific analyzes and estimates are made:

"Net enrollment rates for university students in the age group of 20-24 years by regions and districts."

In a conclusion, it could be summarized that the selection of indicators by education and age groups of children/pupils/students based on the purpose and objectives of this study is an important prerequisite for profiled analyzes and assessments enabling identify territorial differences in time that reflect changes in living standards.

1. Comparative assessment of the differences in the educational infrastructure and the levels of education between Bulgaria and the countries of the European Union

In the overall and comprehensive strategy for the development of the European Union, "Europe 2020" was defined as an important place for education as a subject of socio-economic policies. This fact is reflected in the formulation of two main goals of the development of the education system:

- At the end of the forecast period – 2020 is provided average for EU, at least 40% of the population in the 30-34 age group is estimated to have completed higher education;
- The reduce of the proportion of early school leavers/education to continuing by reaching the national targets by 2020 (in percentage).

Except for the showed, the main objectives in the frameworks of the common strategy in the sphere of education are defined as other major goals, such as making lifelong learning and educational mobility a reality. As universal for all elements of the educational system have been provided policies to improve the quality and effectiveness of education.

Statistically, education is a complex and multilateral system whose indicators are not always measurable. This is suggested by the chosen approach to characterize education, namely in the context of quality of life.²

The publication provides a detailed overview of the various dimensions that form the basis for a deeper analysis of quality of life. However, the focus is on the "fourth dimension – education", which is defined as the process by which society (schools, universities and other institutions) consciously imparts its cultural heritage and accumulated knowledge, values and skills to each generation.

Given these assumptions, education could be defined as an important component of quality of life, respectively of a standard of living that measures the primarily quantitative quality of life profiles.

From the point of view of the present study, as well as for the purpose of the comparative analysis between Bulgaria and the countries of the European Union, the available information³ on the coverage of children in **early childhood education** is of interest. First of all, it is noted that early childhood is a stage in which education effectively influences children's development. Early childhood education "introduces children to organized learning outside the context of the family." This stage is divided into two periods: first for children up to 2 years of age and a second for children from 3 years of age up to the compulsory primary education age, i.e. the so-called pre-school education.

The comparative assessments were made on the basis of the calculated so-called early childhood enrollment rates – percentage of children 3 years of age up to the primary age of compulsory education in the same age group.⁴

Undoubtedly too positive is the fact that for the EU-28, the average enrollment rate for 2016 is 95.3% with a target value of 95%, i.e. the 2020 target has already been achieved. The high value of enrollment rates confirms the modern nature of the EU Member States' value system, which places education at the forefront of the socio-economic system of European societies based on knowledge, technological innovation and economic prosperity.

EU member states could be grouped into three main sets according to the magnitude of their individual enrollment rates by 2016 (Table 1).

² Education in the context of quality of life, online publication of Eurostat.

³ https://ec.europa.eu/Eurostat/statistika-explainet/index.php?title=Qnolitu_of_life, 15.03.2019.

⁴ Ibid.

Table 1

Ranking of EU countries by enrollment rates (ER) by 2016 (%)

№	Countries	Above average ER	Countries	About the average ER	Countries	Under 90% of the average ER
1.	France	100.0	Hungary	95.7	Cyprus	89.7
2.	United Kingdom	100.0	Swiss	95.6	Romania	88.2
3.	Ireland	98.8	Austria	94.9	Finland	87.4
4.	Belgium	98.3	Luxemburg	94.2	Bulgaria	86.5
5.	Denmark	98.1	Poland	93.1	Switzerland	82.2
6.	Malta	98.0	Estonia	92.6	Greece	79.8
7.	Netherland	97.6	Lithuania	91.4	Slovakia	76.5
8.	Island	97.4	Slovenia	90.9	Croatia	75.1
9.	Spain	97.3	Czech	90.7	-	-
10.	Germany	96.6	-	-	-	-
11.	Italy	96.1	-	-	-	-

Source: Compiled by NSI information, under the request of the author, 2019; Enrollment rates represent the proportion of children enrolled in pre-primary education.

More than 1/3 of the EU member states are approaching the maximum value of the enrollment rates of 100%, with this maximum already reached in France and the UK. Moreover, the maximum for France was registered as early as 2010, which means that there is a full coverage of children in the indicated early childhood in pre-school education. For the other countries in the "Above average ER" group, enrollment rates are in the range of 96% to 99%, which also means a high level of enrollment of the children. Enrollment rates for countries in the "around the EU average" range between 91% and 96%, which indicates a relatively high coverage of pre-school education.

The third group includes eight EU Member States, as Bulgaria is at fourth place with an 86.5% ER. The enrollment rates are in a range from 75 to 89.7%. Switzerland, Greece, Slovakia and Croatia (75.1%) have lower ER in comparison with Bulgaria, i.e. 11.4 p.p lower coverage of children in pre-school education. The comparative assessments should take into account that they are based on information for 2016. It is natural that development in a positive direction could be foreseen for the mentioned countries, but certainly for Bulgaria this share has increased to 90%, taking into account the annual increase in the number of kindergartens in the last three years.

There are some difficulties in determining the comparative assessment for Bulgaria, since the answer to the question whether it is better for children in the age range of 3 to 6 to be fully covered by the respective educational institutions is conditional. The answer is individual and depends mainly on the value orientation of families with young children. However, it is clear that the incomplete coverage is not due to a lack of places in kindergartens, as evidenced by the relevant analyzes and assessments by regions and districts of the country. In some of them, they exceed needs.

With regard to **school education**, early school leaving is an important issue for EU countries, as has been found in Bulgaria by relevant analyzes and assessments. In formulating the 2020 flagship target, the EU has identified early school leaving/education as a factor with a negative impact on economic growth and employment. From this point of

view, in addition to the overall target of reducing school leavers to below 10%, EU Member States have also set national targets, taking into account individual country-specific characteristics.⁵

It should be noted that the term “early leaving” in the EU refers to persons between the ages of 18 and 24 who have completed primary education and have not taken part in further education/training.⁶ The magnitude of this phenomenon is defined as the proportion of those who left earlier from the population on age between 18 to 24 years. The average percentage of early school leavers in the EU-28 as of 2017 is 10.6%, i.e. the basic overall goal is almost achieved. However, this does not diminish the situation in some EU Member States, where achieving national targets for reducing the rate of early school leavers remains a challenge and a difficult problem to solve: Malta – the real percentage of early school leavers in 2017 is 18.6%, i.e. 8.6 p.p. is higher than the EU average target of 10%, which is the same as the national target; Spain – the real percentage is 18.3%, i.e. 8.3 p.p. higher than the EU target and 3.3 p.p. higher than the national rate of 15%; Romania – a real percentage of 18.1%, which is 7.1 p.p. higher than the national rate of 11%. As a specific case, Italy can be defined as a real percentage of 14% and a national one of 16%, i.e. the national target has been reached, but Italy still has 4 p.p. a higher rate of early school leaving than the EU-wide target. Obviously, the question can be raised as to the justification of the value of the national target in percentages and to qualify estimates on this basis. As the percentage of national targets for drop-outs varies from 16% for Italy to 3% for Croatia, it is appropriate to carry out benchmarks and assessments on the basis of an EU average of 10% for early school leavers.

Bulgaria is in a relatively favourable situation – the real percentage of early leaving is 12.7% and is only 1.7 p.p. above the national target of 11%. Compared to the EU average of the 10% overall target, it could be argued that Bulgaria is following a steady decline in early school leaving – from 13.8% in 2016, to 12.7% in 2017 and to 12.4% in 2018. Have in mind the reported results of the measures for significant reduction of the number of school leavers conducted by the Ministry of Education and Science, it is quite possible that by the end of 2020 not only the national but also the pan-European target will be reached. It is noteworthy that for 50% of EU Member States, the values of national targets are in line with the pan-European target, which again proves the necessity of their harmonization.

Comparative analyzes and evaluations between the EU Member States in relation to **the higher education** and its significant impact on the quality of life of the whole population provide important information on the level of its development and the need for specific measures to achieve European standards in this area.

For a period of 10 years (2007-2017), a relatively high proportion of higher education graduates between 25 and 64 years of age have reached the EU Member States – in 2017, one third (31.4%) of the EU population – 28. In comparison, the proportion of graduates from secondary or non-tertiary education is almost half of the EU population – 46.1%. From here, there are clear positive outlooks for high school graduates – professional

⁵ There also.

⁶ Eurostat's methodology identifies early school leavers aged 8 to 24 who have not completed higher education than the primary.

achievement, better opportunities for suitable employment and higher income respectively. Taken together, they affect the quality of life of the EU population. In this context, the unemployment rate in the EU-28, depending on educational levels, is of great importance. Persons aged 15-74 with a low level of education in 2017 are more than three times more likely to be unemployed (15%) than those with a high level of education (4.5%). The above-mentioned ratios between education levels and unemployment are particularly high in the Czech Republic, Lithuania, Slovakia, Hungary and Bulgaria, while Cyprus, Greece and Portugal are lower.

Of interest is the comparative analysis of the distribution of the population aged 25-64 by educational levels – low, medium, high. For 2017, according to Eurostat (edat-ifs-9903), this percentage distribution across the EU-28 is correspondingly in the following ratio: 23:46:31. For Bulgaria, the stated ratio is 17:55:28, which shows a very good positioning of the country towards the EU-28. With regard to the low educational level, Bulgaria has 6 p.p. a lower value than the EU average of 28, which is at the expense of the higher value of high school graduates – 55% against 46%. The difference of 9 p.p. can be seen as a positive thing, as it is mainly due to the lower proportion of primary school graduates. Moreover, the difference between the percentages of the graduates of higher education amounts to only 3 p.p., which proves the positive achievements of higher education in Bulgaria. It is important to note that countries such as Hungary, Portugal, the Czech Republic, Croatia, Slovakia, Malta, Italy and Romania register lower values of higher education graduates than Bulgaria. The share of the population with tertiary education in Romania is 10 p.p. lower than Bulgaria's. The fact that the share of higher education graduates in Germany is only 1 p.p. is indicative of the good positioning of Bulgaria, higher for Austria – 3 p.p. In the same direction is the information on the dynamics of the increase in the share of higher education graduates for the period 2007-2017.⁷ For the EU-28 the percentage increase is 7% and for Bulgaria – 6%.

Summarizing the comparative analyzes and evaluations of the changes and the condition of the educational infrastructure and the level of education in the EU-28 and determining the place of Bulgaria, it can be safely stated that, with respect to all three levels of education, there are positive changes, by a number of indicators, Bulgaria approaches/exceeds the respective values of countries with closer or higher socio-economic development.

3. Territorial differences in the coverage of children/students by level of education

3.1. Differences by regions and districts in the coverage of children in pre-school education

The well-founded choice of indicators for comparative territorial analyzes and evaluations of pre-primary education has determined the appropriate ones in view of the objectives of this study. These are the so-called net enrollment rates of children in kindergartens, which are calculated as relative proportions of the number of children attending kindergartens in the age group of 3-6 years by the number of the population in the same age group. The

⁷ The starting year of the study period is 2007, as Eurostat information refers to this year.

selected statistical indicator reflects the degree of coverage of children in the specified kindergartens. In this way, the relevant comparative analyzes reveal the differences between the territorial units of coverage/access of children in pre-school education.

The received values of the net coefficients (Table 2) refer to each year of the study period 2010-2017. The analysis of their changes by years shows that the average for the period changes for all regions is in the positive direction.

Table 2

Ranked net coefficients for pre-school education (3-6 years) by regions for 2010/2013 and 2017 (%)

№	Regions	2010	Regions	2013	Regions	2017
1.	Northcentral	78.5	Northcentral	87.0	Southwestern	82.9
2.	Northwestern	76.8	Northwestern	86.5	Northwestern	80.0
3.	Southwestern	75.9	Bulgaria	83.6	Bulgaria	79.4
5.	Bulgaria	74.9	Southwestern	83.3	Northcentral	79.1
6.	Northeastern	74.4	Southcentral	83.1	Southcentral	77.6
7.	Southcentral	74.2	Northeastern	82.9	Northeastern	77.2
8.	Southeastern	70.7	Southeastern	81.3	Southeastern	76.8
	Scope of variations	7.8	Scope of variations	5.7	Scope of variations	6.1
	Coefficient of variation	3.6	Coefficient of variation	2.7	Coefficient of variation	3.6

Source: Compiled by NSI information under a request of the author.

The analysis and assessment of territorial differences by regions in the coverage of children in pre-primary education can be done in vertical (by region) and horizontal (in time) plan. The more important conclusions regarding the changes in the coverage of children by regions of the country are summarized as follows:

- The highest number of children in the Southwestern region by 2017 is 7 p.p higher than in 2010 and almost equal to the net coefficients compared to 2013. This area "displaces" first place in the North Central Region, which ranks third with a child coverage of 79.1%. It is noteworthy that the "accused" Northwestern region retains the prestigious second place for the seven-year period with 80% coverage in 2017 at 3.2 p.p. advance;
- The other three regions – SCR, NER and SER keep their positions with net coefficients below the average for Bulgaria of 74.9% for 2010, 83.6% for 2013 and 79.4% for 2017.
- The stated findings are also confirmed by the low values of the defined "Score" indicator, which decreased by another 2.1 percentage points over the period 2010-2013, and increased slightly for the period 2013-2017 with 0.4 p.p The coefficients of variation prove the stated finding for low values, for the whole surveyed period 2010-2017 they move in the interval 2.7-3.6%, which again shows slight differences in territorial profile in the framework of the eight-years period;
- The summary conclusion for the changes in the coverage of children in pre-school education by districts is that the territorial differences are insignificant and did not cause significant changes in the coverage of children by regions.

The analysis and assessment of territorial differences by districts in the coverage of children in pre-primary education reveal much more specificity of the changes over the years of the eight-years study period.

The ranking of the 28 districts by the values of the net coefficients is presented in Table 3.

Table 3

Ranked coefficients for pre-school education by districts for 2010, 2013 and 2017 (%)

№	Districts	2010	Districts	2013	Districts	2017
1	Razgrad	84.4	Razgrad	92.8	Smolyan	92.5
2	Smolyan	84.2	Smolyan	91.7	Blagoevgrad	88.8
3	Vratza	83.8	Vratza	91.6	Vratza	86.4
4	Pernik	80.1	Gabrovo	88.8	Pernik	86.0
5	Blagoevgrad	79.6	Blagoevgrad	87.8	Gabrovo	85.5
6	Ruse	79.5	Kyustendil	87.1	Kyustendil	83.7
7	Vidin	79.2	Ruse	86.6	Razgrad	82.1
8	Montana	77.4	Veliko Tarnovo	86.4	Sofia (capital)	81.6
9	Veliko Tarnovo	77.4	Vidin	85.5	Burgas	81.5
10	Dobrich	77.1	Pleven	85.5	Sofia	81.0
11	Silistra	77.0	Montana	85.2	Vidin	80.8
12	Burgas	76.8	Dobrich	85.0	Varna	79.8
13	Plovdiv	76.6	Burgas	85.0	Bulgaria	79.4
14	Shumen	75.2	Plovdiv	85.0	Ruse	79.1
15	Sofia (capital)	74.9	Pernik	84.6	Plovdiv	79.1
16	Pleven	74.9	Lovech	84.1	Stara Zagora	79.0
17	Bulgaria	74.9	Shumen	84.0	Lovech	78.4
18	Sofia	74.8	Stara Zagora	83.9	Montana	78.2
19	Kyustendil	74.6	Bulgaria	83.6	Pleven	77.4
20	Kardzhali	74.0	Kardzhali	83.6	Shumen	77.1
21	Targovishte	73.4	Varna	82.7	Silistra	76.4
22	Varna	73.3	Sofia (capital)	82.2	Veliko Tarnovo	76.4
23	Gabrovo	73.3	Sofia	81.3	Dobrich	75.6
24	Haskovo	72.6	Silistra	81.3	Yambol	75.4
25	Stara Zagora	72.6	Haskovo	81.3	Kardzhali	74.6
26	Lovech	69.7	Yambol	80.6	Haskovo	74.6
27	Yambol	68.0	Targovishte	79.3	Pazardzhik	73.8
28	Pazardzhik	66.8	Pazardzhik	76.8	Targovishte	68.4
29	Sliven	58.7	Sliven	70.6	Sliven	65.8
	Scope	25.8	Scope	22.2	Scope	26.7
	Coefficient of variation	7.2	Coefficient of variation	5.4	Coefficient of variation	7.9

Source: Compiled from information from a NSI report under a request of the author, 2018.

The main conclusions from the analysis of the changes in the coverage of children in pre-school education by districts of the country are synthesized as follows:

- The horizontal analysis of the level of coverage of children shows a consistent annual increase in the values of the respective net coefficients in nearly 90% of the districts by 2017 compared to 2010. Only in three districts is a slight decrease in the net coefficients:

- a) In Razgrad district from 84.4% in 2010 to 82.1% in 2017, it should be immediately noted that in 2010 the district of Razgrad occupies a leading position in the scope of children, and in terms of the average for Bulgaria the difference is almost 10 p.p. in favour of Razgrad district; the decrease in the net coefficients is minimal – by 2.3 p.p, which places Razgrad district in seventh place in the ranking for 2017. It is very important to emphasize that the decrease in the net coefficients of the coverage of children is not due to a deficit of kindergartens, and above all of reducing the number of children attending kindergartens, which for the period 2010-2016 is lower by 906. This, in turn, leads to the need of decrease/reduce the number of kindergartens. Other is the question why the number of children has decreased – due in part to a slight decrease in birthrates in the district, but more likely is the impact of other causes, such as moving to another district, going abroad, take care for the children in a family environment, etc.
- b) The second district is Dobrich with a further slight decrease in the net coefficients – 1.5 p.p, which could be described as a decrease within the statistical error;
- c) In the third district – (Targovishte), a decrease of the net coefficients by 5 p.p. was registered, which ranked it in fourth place below the average net coefficient for Bulgaria in 2010 and in 15th place in 2017; in this area, the birthrate decreased slowly over the period 2010-2017 with very small values. Obviously, the mains causes are rooted in the other mentioned factors.
 - The vertical analysis outlining the changes in the positioning of the districts puts Smolyan district in the leading position – in 2010 on second position with a net coefficient of 84.2% and in 2017 on first place with 92.5%, i.e. 8.1 p.p. increasing the reach of children in pre-school education. This positive fact is mainly explained by the development of a wider kindergarten network. It is confirmed by the number of available places in them, which exceeds the respective demand/needs – for 2010 there are 121 places for 100 children, and for 2017 they are increased to 129. Evidently, efforts are being made in the Smolyan district to expand and improve pre-school infrastructure with innovative and multifunctional kindergartens, which can be used more effectively to promote modern methods of education;
 - It gives the impression that the "lagging" districts (below 70% of the coverage of children) for 2010 are only Lovech, Yambol, Pazardzhik and Sliven, as for all of them there is an increase of the scope for 2017. As a result, under "the critical level" remains only the district of Sliven (with a coverage of 58.6% in 2010 and 65.8% in 2017). As already noted in the district of Targovishte, a decrease in the net coefficient for 2017 is registered, which puts this district in the pre-last place in the overall ranking with 68.4% coverage of children;
 - The last place for the both final years of the study period is firmly occupied by the district of Sliven, despite the increase of the net coefficient by 7.2 p.p. This increase is due to a slight increase in the number of children enrolled in kindergartens. There is clearly no deficit of places in kindergartens, as to 100 children are offered 106 places in 2010 and 110 places in 2017. It could be assumed that the ethnic structure of the population, respectively of the children in the district of Sliven, has some influence;

- Concerning the values of the “Scope” indicator, it can be noted that they are determined by the extreme maximum and minimum values of the reach of children in the indicated areas. Proof of this is the retention of the main core of 12 districts that occupy positions above the average net coefficient of the country.
- The coefficients of variation, which examine the degree of dispersion of the values of the net coefficients for the individual districts around the average, are with too low values – respectively, for the beginning of the study period – 7.2% and for the final 7.9%;
- With regard to the situation in 2013, there is a slight increase in the values of net coefficients, which applies to all areas; this fact could be commented on as a result of demographic factors – a cyclical increase in the number of children in the age group of 3 to 6 years filling the spare capacity in kindergartens and pre-school classes;
- The coefficient of variation for 2013 is lower than the values of these coefficients for the first and the last years of the study period reach to 5.4%, which reveals an even lower degree of differences in the coverage of children between the different districts;

The study of changes in the coverage of children in pre-school education, by analyzing and evaluating the values of the indicator "Places per 100 children in kindergartens" by years of the study period, reveals very clearly its influence on the degree of child insurance (Table 4).

Table 4

Places of 100 children in kindergartens per districts (3-6 years) – number for 2010, 2013 and 2017 (number)

№	Regions	2010	Regions	2013	Regions	2017
1	Northcentral	128	Northcentral	125	Northcentral	123
2	Northwestern	111	Northwestern	110	Northwestern	114
3	Northeastern	105	Bulgaria	102	Northeastern	111
4	Bulgaria	104	Northeastern	110	Bulgaria	106
5	Southcentral	101	Southeastern	99	Southcentral	106
6	Southeastern	100	Southcentral	98	Southeastern	105
7	Southwestern	94	Southwestern	94	Southwestern	97
	Scope	34	Scope	31	Scope	26
	Coefficient of variation	11.1	Coefficient of variation	10.8	Coefficient of variation	7.0

Source: Compiled from information from a NSI report under the request of the author, 2018.

The horizontal analysis shows that in 2013 in all districts there was a minimal decrease in the number of places, but at the end of the study period, an increase in their number per 100 children was observed again. Even more striking is the fact that, with the exception of the SWR for all other regions, in 2017, the places exceed the "standard" number of 100 children. For the SWR the explanation is clear – it includes Sofia (Capital) and the district of Sofia, where some slight deficit of places in kindergartens is registered, and for 2017 it is only 3 places.

Regarding the changes in “Scope” indicator, the rating is positive, i.e. "constriction" is noticeable – with 8 seats per 100 children. The coefficients of variation also recorded a decrease process of 0.3 p.p. in 2013 and by 4.1p.p. in 2017, which is an indicator of low scattering around the average level.

Obviously, a more detailed analysis and evaluation of changes in this indicator is needed, which is why it is appropriate to specify the study at the district level as well (Table 5).

Table 5
Places per 100 children in kindergartens by districts for 2010, 2013 and 2017 (number)

№	Districts	2010	Districts	2013	Districts	2017
1	Razgrad	151	Razgrad	154	Shumen	140
2	Veliko Tarnovo	127	Shumen	127	Razgrad	134
3	Shumen	127	Ruse	125	Veliko Tarnovo	133
4	Yambol	127	Veliko Tarnovo	123	Kardzhali	132
5	Ruse	126	Smolyan	212	Dobrich	130
6	Kardzhali	123	Yambol	118	Smolyan	129
7	Smolyan	121	Kardzhali	117	Silistra	120
8	Montana	119	Dobrich	116	Yambol	118
9	Silistra	119	Montana	113	Vratza	117
10	Targovishte	116	Vratza	112	Montana	116
11	Dobrich	115	Targovishte	112	Ruse	115
12	Pleven	112	Vidin	110	Targovishte	113
13	Vratza	110	Pleven	110	Blagoevgrad	113
14	Kyustendil	110	Silistra	109	Pleven	112
15	Gabrovo	109	Kyustendil	108	Vidin	111
16	Lovech	106	Sofia	108	Lovech	111
17	Sliven	106	Gabrovo	108	Gabrovo	111
18	Blagoevgrad	106	Blagoevgrad	105	Kyustendil	111
19	Pazardzhik	106	Bulgaria	102	Sliven	110
20	Vidin	105	Sliven	102	Sofia	107
21	Bulgaria	104	Lovech	101	Pazardzhik	107
22	Haskovo	102	Stara Zagora	100	Bulgaria	106
23	Pernik	101	Pazardzhik	100	Burgas	105
24	Sofia	100	Haskovo	99	Haskovo	105
25	Stara Zagora	96	Pernik	99	Stara Zagora	102
26	Burgas	93	Burgas	91	Pernik	99
27	Plovdiv	91	Plovdiv	89	Varna	94
28	Varna	90	Sofia (capital)	87	Plovdiv	94
29	Sofia (capital)	87	Varna	87	Sofia (capital)	90
	Scope	64	Scope	67	Scope	50
	Coefficient of variation	12.8	Coefficient of variation	13.0	Coefficient of variation	12.0

Source: Compiled from information from a NSI report under the request of the author, 2018.

As a result of the ranking of the districts for 2010, according to the indicator "Places per 100 children in kindergartens", 20 districts are identified, in which the number of available places exceeds the needs. These areas have higher values of the indicated indicator than their average for the country. Below the standard number are ranked five districts – Stara Zagora, Burgas, Plovdiv, Varna and Sofia (Capital), with the lowest value being the indicator for Sofia (Capital) – 87 places per 100 children. It is quite logical for districts with

a larger population, respectively with more children, to find a relatively minimal deficit of places in kindergartens. For the period after 2010, there has been a gradual increase in values in the indicated areas.

The comparative analysis between 2010, 2013 and 2017 shows that in the "lagging" districts there is an increase in the number of places per 100 children, and for the districts of Burgas and Stara Zagora it exceeds the critical threshold of 100 places. As a result, the "package" of districts with a too minimal deficit of places in kindergartens is shaped by the districts of Sofia (Capital), Plovdiv and Varna. As already emphasized, this fact is due to the continuous influx of settlers from small towns and villages in the country. However, in the near future, if Bulgarian citizenship is granted, it is possible, but at the same time, too worrying and, from a socio-economic point of view, to increase the population, respectively of the children, especially in the big cities. This will inevitably lead to a shortage of places in kindergartens, create new ones and exacerbate the problems already mentioned.

The territorial comparative analyzes and estimates of the coverage of children in pre-school education make it possible to systematize the following important conclusions:

- The differences found per regions of the country are insignificant and have not led to structural changes;
- A positive trend of the annual increase in the values of the net coefficients for the coverage of children in kindergartens was registered in almost 90% of the districts;
- Characteristic for the whole studied period is the increase of the values of the indicator for the number of places per 100 children, which in the predominant territorial units exceed the "standard" number of 100 children. However, this fact does not always have a positive effect as the cost of maintaining kindergartens increases;
- The ranking of the districts by 2017 per the values of the indicator "Places per 100 children" reveals the totality of three main districts (Plovdiv, Varna and Sofia/Capital), at which they are below the standard threshold but with insignificant differences;
- The values of this indicator are increasing by years of the surveyed period, but there is a danger of "reversing" of this positive trend as a result of the continuous influx of settlers from smaller towns and villages, but also settlers from other countries receiving Bulgarian citizenship.

3.2. Differences by regions and districts in the coverage of students in the school education

Similarly to the pre-primary education survey approach, and with regard to school education, the "net enrollment ratio" is the most appropriate for the purposes of the study. It is calculated as the relative proportion of the number of students actually enrolled in school education in the age group 7-19 years to the number of the population of the same age group. In this way, the extent of pupil enrollment in school education is measured. On the basis of the values of the net coefficients, comparative analyzes and estimates are made for the respective territorial units. What do the changes in the net coefficients determined by the regions of the country for the period 2010-2017 show (Table 6).

Table 6

Ranked net student enrollment rates (7-19 years) by region (%)

No	Regions	2010	Regions	2013	Regions	2017
1.	Southwestern	87.3	Northwestern	87.2	Southwestern	85.5
2.	Bulgaria	83.5	Southwestern	87.0	Northwestern	84.4
3.	Southcentral	83.4	Bulgaria	85.6	Bulgaria	82.4
4.	Northeastern	83.1	Northcentral	85.2	Southeastern	81.8
5.	Southeastern	81.5	South central	85.0	North central	81.4
6.	Northwestern	81.0	Southeastern	84.7	Southcentral	81.0
7.	North central	80.8	Northeastern	84.1	Northeastern	78.2
	Scope	6.5	Scope	3.1	Scope	7.3
	Coefficient of variation	2.9	Coefficient of variation	1.5	Coefficient of variation	3.2

Source: Compiled under an information from a NSI report after a request of the author, 2018.

The comparative analysis and evaluation by regions reveal the following trends:

- The Southwestern region is firmly in leading position, both in the initial year and throughout the study period, with relatively high values of net coefficients tending to the reference maximum. It is noteworthy that the values of the net SWR coefficients exceed the national average – by 3.8 p.p. in 2010, up 1.4 p. p. , in 2013 and by 3.1 p.p. in 2017;
- Changes in their ordering are observed in the other regions, but this does not lead to noticeable territorial differences. This fact is explained by the slight differences in the values of the net coefficients. This is also evidenced by the low values of the respective coefficients of magnitude – 6.5% and 7.3%;
- Only in the Northeast region, there is a more noticeable decrease in the net odds, which places it from the comparatively prestigious third place to the last one. In fact, the difference is not big – the enrollment rate for students for the period 2010-2017 has decreased by almost 5 p.p. The analysis of the absolute values of both students and the population in the age group of 7-19 years shows a gradual decrease in their number. However, the difference is due to the accelerated decrease in the number of students compared to the population in the specified age group. In all probability, the reasons for these differences are rooted in the ethnic structure of the population in this region.

The indicated territorial differences in the range of the students could be explored in greater detail by disaggregating the regions by districts and ranking them according to the values of the net coefficients (Table 7).

The analysis and evaluation of the ranked areas by the magnitude of the net coefficients show that their values are at a range, as well as with coefficients of variation, showing a low degree of scattering over the whole study period. These indicators identify the differences between the areas of coverage of pupils in school education that are insignificant. At the same time, there is an increase in the values of the net coefficients, which means that the range of students is increasing, including in the last of the mentioned districts – Sliven and Silistra.

Table 7

Ranked net enrollment rates of students (7-19 years) by districts (%)

№	Districts	2010	Districts	2013	Districts	2017
1	Sofia (capital)	89.7	Lovech	89.0	Blagoevgrad	88.4
2	Pernik	88.6	Stara Zagora	88.1	Lovech	87.5
3	Varna	87.5	Blagoevgrad	88.1	Gabrovo	87.5
4	Plovdiv	85.6	Sofia (capital)	87.7	Smolyan	87.0
5	Blagoevgrad	85.3	Pleven	87.4	Pernik	85.6
6	Smolyan	84.7	Veliko Tarnovo	87.3	Stara Zagora	85.5
7	Veliko Tarnovo	84.4	Gabrovo	87.2	Vratza	85.1
8	Burgas	83.8	Vidin	87.2	Sofia (capital)	85.1
9	Bulgaria	83.5	Yambol	87.1	Kyustendil	85.0
10	Montana	83.4	Smolyan	87.1	Pleven	84.2
11	Stara Zagora	83.3	Pernik	87.0	Yambol	84.1
12	Haskovo	83.3	Montana	86.6	Sofia	83.7
13	Kardzhali	83.0	Varna	86.5	Kardzhali	83.7
14	Yambol	82.3	Plovdiv	85.9	Vidin	83.6
15	Sofia	82.1	Kyustendil	85.9	Bulgaria	82.4
16	Kyustendil	82.0	Vratza	85.9	Burgas	82.3
17	Ruse	82.0	Burgas	85.7	Montana	82.1
18	Gabrovo	81.9	Bulgaria	85.6	Veliko Tarnovo	81.8
19	Vidin	80.8	Haskovo	85.4	Haskovo	81.6
20	Vratza	80.8	Razgrad	84.9	Ruse	81.3
21	Dobrich	80.7	Ruse	84.6	Varna	81.2
22	Pleven	80.4	Shumen	84.4	Plovdiv	81.1
23	Shumen	80.4	Kardzhali	83.5	Shumen	80.4
24	Lovech	80.3	Sofia	83.0	Razgrad	80.2
25	Pazardzhik	78.7	Pazardzhik	82.6	Silistra	77.1
26	Razgrad	77.9	Dobrich	81.0	Pazardzhik	76.9
27	Targovishte	76.1	Silistra	80.6	Sliven	74.5
28	Sliven	74.5	Targovishte	79.3	Targovishte	73.5
29	Silistra	74.4	Sliven	76.9	Dobrich	71.2
Scope		15.3	Scope	12.1	Scope	17.2
Coefficient of variation		4.5	Coefficient of variation	3.4	Coefficient of variation	5.2

Source: Compiled under an information from a NSI report after a request of the author, 2018.

The main changes and differences between the areas of pupil coverage are as follows:

- The net enrollment ratio of students in school education in Sofia (capital) decreased by 4.6 percentage points over the eight-year study period. However, the main reason for this “relocation” of Sofia (capital) should be pointed out immediately from first place in 2010 to fourth place in 2013 and eighth place in 2017. The analysis of the components of the net coefficients by which their values are calculated shows that the number of students has increased from 117900 in 2010 to 127635 in 2017, i.e. with nearly 10 000 students. A similar increase is registered in the number of the school-age population – from 131486 to 149933, i.e. by over 18 thousand. The tide to Sofia is evidently increasing annually;

- The disaggregation of the increase in the number of students in Sofia (capital) by degrees of education reveals that the largest increase is in the elementary education (I-IV class) – from 39280 for 2010 to 48035 for 2017, i.e. nearly 9000 students. This situation undoubtedly complicates primary education in Sofia city and requires appropriate action towards improving and developing the school base, as well as with regard to policies for reducing through the economic levers the inflow of young families (with students from first to fourth grade) in the capital. Increasing the number of students from lower secondary education is not problematic (by about 3 thousand), as well as from secondary education, with a decrease in the number of students with more than 3 thousand;
- In horizontal plan, it is noted that the values of the net coefficients for a number of districts (Lovech, Gabrovo, Vratsa, Kyustendil, Pleven, Vidin) have increased in the three surveyed years, and they already occupy positions above the average for Bulgaria; this is evidence of the sustainable development of these areas, which is reflected in positive changes in the field of school education;
- However, in parallel with this process, in other areas that have occupied the leading positions in the ranking (Varna, Plovdiv, Veliko Turnovo, Burgas) in 2010, after an eight-year period in 2017, they move to its lower floors; it should be noted that in these big cities there is an increase in the number of students mainly in primary education, which is similar to the situation in the city of Sofia, changes the order of the districts;
- It gives an impression that the "package" of districts, characterized by relatively low values of net coefficients – below 80% (Silistra, Pazardzhik, Sliven, Targovishte) is maintained throughout the study period; the main reason is the decrease in the number of students in all three levels of education.

What are the main reasons for the decrease in the number of students or respectively their inclusion in school education?

Common reasons that affect almost all areas are: declining birth rates; population restructuring by districts with a view to providing employment for parents and appropriate education of children; leaving the education for various specific reasons.

It is of interest to investigate **the reasons for leaving education by levels of education** on average for the country, as well as over the years of the study period (Table 8). The statistics on graduates leaving the national average directs the management bodies to the areas in which they should concentrate their efforts, ranked according to the scale of the manifestation of the various reasons. The main reasons included in this study are consistent with the relevant classification.

In terms of primary education (grade I – IV), the drop-out rate is gradually increasing over the years of the study period. The relative share of drop-outs compared to the total number of pupils in primary education varies from 2.2% in 2010 to 2.6% in 2017. This increase seems small at first glance, but its absolute value is 1,450 pupils. Ranking the main reasons for leaving school puts first the number of students who have gone abroad from primary education. The school leaving because of family reasons ranks second place and has a positive downward trend. Obviously, the implemented programs and strategies achieved the

desired results mainly through measures to increase the economic and social stability of families at risk their children to drop-out of school education.

Table 8

Leavers by the level of education and reasons for leaving for the period 2010-2017 total for the country

№	Reasons of leaving	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
	Total							
1	Leavers (number)	18766	18450	17571	17704	21146	21170	20092
2	Relative share of leavers (%)	2.4	2.4	2.3	2.4	2.8	2.9	2.8
3	I – IV grade							
4	Leavers – number incl.	5596	5678	5268	5418	6230	6568	7052
5	Because of lack of wish	371	324	231	173	278	251	347
6	Because of family reasons	2658	2630	2491	2289	2098	2251	2547
7	Departure abroad	2237	2662	2206	2598	3386	3504	3643
8	Relative share of leavers (%)	2.2	2.2	2.1	2.1	2.4	2.5	2.6
9	V -VIII grade							
10	Leavers – number incl.	6873	6749	6530	6679	8132	8139	7295
11	Because of lack of wish	1141	1018	839	889	1003	1089	944
12	Because of family reasons	3360	3169	3188	2840	3008	2944	2621
13	Departure abroad	1926	2093	2050	2343	3264	3328	3238
14	Relative share of leavers (%)	3.2	3.1	2.9	3.0	3.7	3.8	3.5
15	IX – XII grade							
16	Leavers – number incl.	6297	5978	5708	5587	6632	6351	5745
17	Because of lack of wish	1977	1641	1495	1424	1672	1757	1379
18	Because of family reasons	3122	3162	3040	2750	3148	2659	2482
19	Departure abroad	896	910	965	1152	1335	1498	1526
20	Relative share of leavers (%)	2.2	2.1	2	2.1	2.5	2.4	2.1

Source: Compiled by Information from "Education in Bulgaria", 2017 page 104 and by NSI at the request of the author, 2018.

The next level of education (V-VIII grade) also shows an increase in the number of school drop-outs, but it is lower with 420 students. Their relative share had changed from 3.2% in 2010 to 3.5% in 2017. The number of people who have gone abroad is gradually increasing, and for the period 2013-2017 it is emerging as a primary reason.

The drop-outs students who left, because of family reasons decreased by 740, but showed higher values than drop-outs. This fact predetermines the need to extend the measures included in the respective programs to stimulate the economic activity of parents.

The analysis and evaluation of changes in the number and proportion of students who have left gymnasium (secondary) education show that they have the lowest values compared to the previous levels of education. The total number of drop-outs has been increasing at a low rate, with 550 students for the period under study. It is worth noting that the number of students abroad has increased by over 600 students, which is probably due to the desire of these young people to start work abroad instead of completing their high school education in Bulgaria.

It is noticeable, however, that the number of those who left for family reasons has decreased markedly from 3122 in 2010 to 2482 in 2017. This finding demonstrates an

increase in the standard of living and the capacity of families with children in this age group. For them, obviously, the influence of family factors is not decisive.

Much more specific and with direct practical application is the information about those who have left the training by groups of classes, causes and by region (Table 9). For the purposes of the study – by analyzing and evaluating the changes in the differences between the regions, it is necessary to analyze the changes in the scope of the drop-outs by groups of classes, reasons for leaving and regions for the whole studied period. This determines the need to systematize the relevant information and present it in tabular form for the academic years 2010/2011 and 2016/2017.

Table 9

Drop-outs students by grade's groups, reasons for leaving and districts for 2010/2017
(number)

Regions/reasons	Grade groups							
	I – IV grade		V – VIII grade		IX – XII grade		Total I – XII grade	
	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17
Bulgaria								
Leavers	5596	7052	6783	7295	6297	5745	18766	20092
Lack of wish	371	347	1141	944	1977	1339	3489	2670
Family reasons	2658	2547	3360	2621	3122	2482	9140	7650
Departure abroad	2237	3643	1926	3238	896	1526	5059	8407
Northwestern regions								
Leavers	950	880	968	944	953	862	2871	2686
Lack of wish	79	60	157	126	247	266	483	452
Family reasons	573	365	575	410	568	417	1716	1192
Departure abroad	231	402	201	331	106	147	538	880
Northeastern region								
Leavers	985	1112	1264	1103	995	884	3234	3099
Lack of wish	53	33	155	115	229	152	437	300
Family reasons	414	344	651	319	542	398	1607	1061
Departure abroad	454	649	408	597	181	312	1043	1558
Southeastern region								
Leavers	922	1523	1183	1583	1048	1011	3153	4117
Lack of wish	77	96	241	245	339	254	657	595
Family reasons	395	621	532	622	521	474	1448	1717
Departure abroad	377	674	351	625	127	195	855	1494
Southwestern region								
Leavers	715	900	946	961	844	866	2505	2727
Lack of wish	58	82	185	163	342	255	585	500
Family reasons	319	299	422	323	296	296	1037	918
Departure abroad	278	446	226	381	152	221	656	1048
Southcentral region								
Leavers	1234	1793	1540	1830	1516	1328	4290	4951
Lack of wish	75	42	312	140	648	305	1035	487
Family reasons	621	629	786	653	663	527	2070	1809
Departure abroad	491	1040	348	937	142	409	981	2386
Northcentral region								
Leavers	800	844	972	874	941	794	2713	2512
Lack of wish	29	34	91	155	172	147	292	336
Family reasons	336	289	394	294	532	370	1262	953
Departure abroad	406	432	392	367	188	242	986	1041

Source: Compiled by NSI information, at the request of the author, 2018.

The multidisciplinary information of high social and economic importance presented in the regions of the country allows us to analyze the trends in the scale of the too negative phenomenon – leaving school. For the 2010-2017 period, school leavers increased by about 1,300 students, the highest being for the South Central District for the two final years – 4290 and 4951 respectively. It is noteworthy that the increase in the drop-out rate in the South-East region is also relatively significant – by 960. Some reduction in their numbers was achieved in the North-West, North-Central and North-East regions.

Undoubtedly, important information about managerial decision-making is also obtained by differentiating drop-out students for reasons of drop-out. With regard to the reason for "reluctance" to attend school, their number is noticeable, with more than double the reduction in the South Central Region. Apparently, the implementation of appropriate programs aimed at overcoming the reluctance to attend school has increased their motivation and value orientation.

The first in terms of importance at the beginning of the study period was the "Family Reasons" group – in all districts, drop-outs for family reasons have the highest relative share, accounting for nearly 50% for the South Central Region. An analysis of this situation shows that, to a large extent, leaving school was predetermined by family financial and material circumstances. However, in the period 2010-2017, in some of the regions, a process of reducing the scale of manifestation of this cause at the expense of drop-outs due to "departure abroad" is gradually starting.

Regarding the increase in the relative share of drop-outs due to departure abroad, which is only observed in two regions – Northwest and South Central region, it could be argued that this is not a trend for other areas as well as for the country. The increase in drop-out rates due to leaving abroad in the two mentioned districts is mainly due to the elementary school students (grades I-IV), which show a higher growth rate than drop-outs from upper secondary and upper secondary education.

The mentioned above facts could be explained by the logical assumption that the parents of children leaving primary school belong to the younger age groups who are educated, but with insufficient experience and skills, and therefore prefer to acquire them in more advanced ones mainly European countries. From this point of view, it could be argued that the impact of the cause of the "departed abroad" will gradually self-regulate depending on the future development of the country.

Information on school leavers in the territorial profile of the districts is presented in much greater detail (Table 10). The analysis reveals that leaving for family reasons is of the highest severity in all areas except Sofia (capital), where their absolute number at the beginning of the study period is twice lower than that of those leaving due to departure abroad. This trend is also evident in other regions during the period 2010-2017, with more sensitive changes in the districts of Varna, Sofia (capital), Plovdiv, Pazardzhik.

Table 10
Leaving students by reason of leaving and by district for the 2010/2011 and 2016/2017
school years (Number)

№	Districts	Reasons for leaving							
		Total		A lack of wish		Family reasons		Departure abroad	
		2010/11	2016/17	2010/11	2016/17	2010/11	2016/17	2010/11	2016/17
1	2	3	4	5	6	7	8	9	10
1	Vidin	279	384	32	11	157	151	67	175
2	Vratza	675	602	100	207	473	257	86	104
3	Lovech	532	435	109	67	271	187	118	142
4	Montana	533	539	99	84	299	230	75	206
5	Pleven	852	726	143	83	369	367	153	253
6	Veliko Tarnovo	867	687	65	67	422	290	302	299
7	Gabrovo	197	162	36	7	126	86	87	63
8	Razgrad	506	559	57	97	203	209	231	199
9	Ruse	743	702	103	108	357	254	218	294
10	Silistra	343	557	31	57	154	114	148	186
11	Varna	1350	1448	194	141	675	512	418	709
12	Dobrich	758	761	128	78	384	194	205	437
13	Tragovishte	604	356	54	16	312	141	222	170
14	Shumen	522	534	61	65	236	214	198	242
15	Burgas	758	1363	161	241	343	579	214	434
16	Sliven	1179	1171	246	168	517	487	349	439
17	Stara Zagora	805	1262	168	138	331	501	238	508
18	Yambol	411	321	82	48	257	150	54	113
19	Blagoevgrad	486	744	115	108	220	345	105	251
20	Kyustendil	260	195	11	43	169	47	67	78
21	Pernik	199	183	22	30	137	73	29	76
22	Sofia	546	533	112	159	322	278	61	59
23	Sofia (capital)	1014	1072	325	160	189	175	394	584
24	Kardzhali	320	380	65	39	158	155	80	175
25	Pazardzhik	1009	1239	146	105	477	377	329	688
26	Plovdiv	2069	2427	662	207	921	966	402	1166
27	Smolyan	34	63	13	16	4	1	15	35
28	Haskovo	858	842	149	120	510	310	155	322

Source: Compiled by NSI information, at the request of the author, 2018.

It is of interest to determine the strength of the impact of the “school drop-out” phenomenon for the period studied by measuring the relative proportions of drop-outs relative to students by region and district. This gives a clearer picture of its scale, and it can be argued that this process changes over the years 2010-2017 with few exceptions within the same framework. This, on the one hand, means that the reasons given do not appear to a greater extent or that no new ones have emerged that change the direction of development on the other (see table 11).

Table 11

Relative share of drop-out students by students in I-VIII grades in general and special schools by region (%)

№	Regions	2010/2011	2011/2012	2012/2013	2013/2014	2014/2015	2015/2016	2016/2017
	Bulgaria	4.89	5.64	4.63	5.45	5.80	6.59	5.49
1	Northwestern	6.35	7.08	6.38	6.64	6.43	7.71	6.18
2	Northcentral	6.30	6.80	5.09	6.14	5.53	5.82	6.27
3	Northeastern	6.31	6.75	6.01	7.18	8.27	7.53	6.18
4	Southeastern	5.04	5.82	4.66	6.22	6.17	8.47	7.00
5	Southwestern	2.46	2.89	2.35	2.64	2.73	3.31	2.60
6	Southcentral	5.34	6.65	5.42	6.09	6.73	8.31	6.89
	Scope	3.89	4.19	4.04	4.63	5.55	5.16	4.40
	Coefficient of variations	28,3	26.4	28.8	27.7	30.7	28.8	27.9

Source: Compiled by NSI information at the request of the author, 2018. The information covers students in I-VIII grades, since after VIII grade education is not compulsory.

These facts relate mainly to the North-West Region, North-Central Region, North-East Region and South-West Region. A certain increase in the relative share of students dropping out of students is found in the South-East region, where it increased by two percentage points, as well as in the South Central region – by 1.5 percentage points places in the corresponding ranking for 2017 with corresponding values – 7% and 6,8%. The lowest share is the relative share of those leaving the Southwest region – 2.46% in 2010 and 2.60% in 2017. As is known, Sofia (district) and Sofia (capital) are included in this area, which predetermines their low values.

Obviously, it is necessary to implement, as far as practicable, relevant regional programs in other regions of the country.

Particularly rich is the information on the relative share of drop-out students to students, which covers all areas by years 2010-2017 (see Table 12).

The highest relative shares stand out for the districts of Vidin, Razgrad, Dobrich, Sliven, Pazardzhik and Plovdiv, which range from 8% to 10%.

The districts with drop-out rates between 6 and 8% for 2017 are also not small – Vratsa, Montana, Rousse, Silistra, Varna, Targovishte, Burgas, Stara Zagora, Haskovo. It is noteworthy that the aggregate of these two groups of districts with relatively high relative proportions of drop-outs represents 50% of all districts. Obviously, this is a serious signal of the need for effective measures in these areas to significantly reduce the number of drop-outs students. It is important to note, however, that in a number of districts their number decreased in just one academic year 2015/2016 – 2016/2017 – in Vratsa and Burgas by 3 pp, in Dobrich – 2.5 pp., in Sliven, Pazardzhik and Plovdiv with 2 p.p. The analysis of the changes in these districts reveals that the decrease in the relative share of drop-outs is

mainly due to a decrease in their number for family reasons. But in parallel with this fact, there is a slight increase in the number of drop-outs due to leaving abroad.

Table 12
Relative share of drop-out students to these who are in a process of education I-VIII grade in general and special schools by district (%)

№	Districts	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16	2016/17
1	Vidin	5.03	6.51	6.79	6.10	7.64	9.19	8.92
2	Vratza	7.09	10.30	5.74	5.53	7.32	9.21	6.07
3	Lovech	6.21	6.44	6.66	6.87	5.55	5.65	5.01
4	Montana	6.49	6.23	6.16	7.48	6.53	8.43	7.63
5	Pleven	6.27	5.56	6.68	7.10	5.81	6.77	5.21
6	Veliko Tarnovo	6.99	7.97	5.64	7.17	6.07	6.95	5.38
7	Gabrovo	4.05	5.79	4.53	4.86	3.78	5.08	3.07
8	Razgrad	6.79	6.58	5.92	6.32	7.98	5.46	8.66
9	Ruse	6.74	6.00	4.49	5.23	4.21	6.02	6.90
10	Silistra	5.57	7.06	4.60	6.57	5.62	4.29	7.12
11	Varna	6.02	5.65	5.65	6.96	8.60	7.65	6.04
12	Dobrich	7.70	7.30	6.33	8.21	10.67	10.58	8.02
13	Targovishte	8.12	9.34	8.16	8.48	8.94	7.27	6.11
14	Shumen	4.37	6.77	5.14	5.69	4.48	4.23	4.46
15	Burgas	2.89	3.95	3.34	4.67	5.49	8.90	6.11
16	Sliven	10.07	10.22	8.31	10.44	9.57	12.49	10.41
17	Stara Zagora	4.24	5.90	3.95	6.25	5.33	7.16	6.71
18	Yambol	4.82	3.77	3.90	3.65	4.34	3.65	4.38
19	Blagoevgrad	2.78	3.38	2.74	3.42	3.14	3.32	4.37
20	Kyustendil	4.92	4.77	3.49	4.89	4.55	4.54	3.59
21	Pernik	3.28	3.80	4.03	3.04	4.15	3.85	3.36
22	Sofia	4.53	5.23	4.70	4.47	4.85	4.90	4.40
23	Sofia(capital)	1.56	1.79	1.44	1.63	1.85	2.72	1.57
24	Kardzhali	3.47	4.18	3.40	3.42	3.48	4.12	4.29
25	Pazardzhik	6.76	7.75	6.86	7.60	8.87	10.86	8.80
26	Plovdiv	5.71	8.30	6.15	6.86	7.79	9.72	7.77
27	Smolyan	0.61	0.66	0.99	0.69	1.19	1.59	0.97
28	Haskovo	5.76	5.40	4.77	6.30	5.53	7.10	6.19
Scope		9.47	9.65	7.32	9.75	9.48	10.90	9.44
Coefficient of variations		38.52	37.88	35.42	37.11	39.80	41.80	38.89

Source: Compiled by NSI information at the request of the author, 2018. The information covers students in grades I-VIII, since after grade VIII education is not compulsory.

In a sense, as an exception can be interpreted as the relative proportions of drop-outs in the Smolyan district, where they are comparatively much lower values and at the same time show an annual decrease throughout the study period: an initial increase of 0.61% in the 2010/2011 academic year to 1.59% in 2015/2016 academic year and again a decrease of 0.97% in 2016/2017 academic year. Based on the assessment of the impact of the various reasons for leaving, it is found that the "family reasons" in Smolyan district do not have a real impact on leaving school, and the impact of the reason "gone abroad" is very insignificant – from 15 persons in 2010/2011 up to 35 in 2016/2017. These analyzes and evaluations lead to the conclusion that appropriate measures have been taken in the district

of Smolyan to prevent and limit the phenomenon of "leaving school", which have led to noticeable positive results.

Sofia (capital) also has a low relative share – 1.57% in 2017, the value of which shows slight variations over the different years of the period. This fact proves the stability of the capital's educational infrastructure.

The importance of relative share information is expressed in the ability to use it for specific conclusions about the magnitude of the school drop-out phenomenon and accordingly take urgent measures and actions to achieve minimum relative share values.

The detailed analyzes and evaluations of the phenomenon of "leaving school" by degrees of education and for specific reasons for all regions and districts of the country provide versatile information on its territorial scope and the ranking of the impact of the analyzed reasons. Of particular practical importance are indicators that measure the relative proportions of students who have dropped out compared to students in regions and districts. This creates an opportunity for the development of regional programs and action measures aimed at limiting and gradually reducing to a minimum/zero values the drop-out rates, except for those which are justified by subjective reasons. Leaving school, although within reasonably acceptable limits, should not exist in the modern educational infrastructure. In this context, one of the main priorities for its development policies is the need to highlight the maximization of its manifestation.

3.3. Features of differences by regions and districts in the range of students in higher education

In the higher education system, the main indicators are the number of students enrolled in general, as well as by type of higher education in the age group of 20-24 years. The calculation of the net enrollment coefficients of students as relative proportions of enrolled students to the population in the same age group is somewhat conditional. It is generated by the specific features of student admission and education:

- The higher education is not compulsory, so it is not entirely correct to speak about student enrollment, i.e. to match their numbers to the population in the same age group. The difference between these quantities should not be interpreted as a mismatch/discrepancy between the actual number of students and the number of potential students;
- The differences between these indicators cannot be described as a deficiency in the educational infrastructure, and in particular as an inability to reach a higher population in the higher education age group 20-24;
- The concept of "Scope of students" has a conditional character and does not include the same content as in pre-school and school education. Rather, it is more appropriate to use the concept of "population coverage in the age group of 20-24 in the higher education system";

- The calculation of the net coefficients in this way essentially provides information on the proportion of the population concerned that is covered in higher education;
- In the analysis and assessment of the values of net coefficients by regions and districts of the country, there are possible cases, such as the number of students in a given region or area being higher than the population in them of the same age group. It is clear that this is possible when this region or district is a university centre and a large number of students from other territorial units are concentrated there. Another possible case is the presence of too few students or zero, but that does not mean that there are no students enrolled in this area – they are assigned to students in the area where they study and reside.

The specificities of the net coefficients in higher education mentioned above do not limit the opportunities to use them for specific analyzes and assessments by regions and districts.

The net coefficients for the higher education by regions and districts are ranked for 2010, 2013 and 2017 (see Tables 13 and 14).

Table 13

Ranked net coefficients for the higher education by regions (%)

Regions	2010	Regions	2013	Regions	2017
Southwestern	84.4	Southwestern	87.2	Northcentral	111.7
Northeastern	64.8	Northcentral	82.2	Southwestern	104.3
Northcentral	63.3	Northeastern	66.3	Northeastern	73.1
Bulgaria	50.0	Bulgaria	60.5	Bulgaria	72.0
Southcentral	30.2	Southcentral	45.4	Southcentral	60.0
Southeastern	21.9	Southeastern	24.6	Southeastern	27.0
Northwestern	3.0	Northwestern	5.9	Northwestern	9.8
Scope of variations	62.5	Scope of variations	62.6	Scope of variations	84.7

Source: Compiled under an information by “Education in the Republic of Bulgaria, 2010-2017”, NSI, Regional Review; “Population-Demography, Migration and Forecasts”, NSI, Infostat

The values for the Southwestern region are expected to increase for all three years, with the corresponding value exceeding the reference value in 2017 and amounting to 104.3%. This means that in this area with a strong university presence, the number of students is higher than the population in the age group 20-24. A similar situation is observed in the North central district, in which the value of the net coefficient is 111.7 %.

Regarding the regions whose net coefficients are below the average level for the country, it could be noted that they also register development, the most sensitive being the changes in the coverage in the South central region, where it doubles – from 30.2% in 2010 to 45.4% in 2013 and 60% in 2017.

In order to obtain real information about the values of the “Scope” Indicator, the North-west region is excluded from its calculation, as the net coefficients for all three years are too low. This is predetermined by the fact that the net coefficients for its constituent areas, such as Vidin, Lovech, Montana, have zero values. However, the scale is relatively high – in 2010 it amounted to 62.5%, in 2013 to 62.6% and in 2017 its value increased to 84.7%.

Table 14

Net coefficients for higher education by districts

№	Districts	2010	Districts	2013	Districts	2017
1	Vidin	-	Vidin	-	Vidin	-
2	Vratza	1.7	Vratza	7.5	Vratza	14.8
3	Lovech	-	Lovech	-	Lovech	-
4	Montana	-	Montana	-	Монтана	-
5	Pleven	7.9	Pleven	12.7	Pleven	19.3
6	Veliko Tarnovo	109.3	Veliko Tarnovo	132.3	Veliko Tarnovo	186.5
7	Gabrovo	80.7	Gabrovo	105.7	Gabrovo	167.5
8	Razgrad	3.6	Razgrad	4.6	Razgrad	5.2
9	Ruse	50.9	Ruse	68.9	Ruse	69.5
10	Silistra	9.6	Silistra	7.4	Silistra	8.1
11	Varna	114.5	Varna	103.9	Varna	115.7
12	Dobrich	-	Dobrich	-	Dobrich	-
13	Targovishte	-	Targovishte	-	Targovishte	-
14	Shumen	55.2	Shumen	66.0	Shumen	74.5
15	Burgas	36.4	Burgas	34.6	Burgas	32.7
16	Sliven	3.5	Sliven	5.3	Sliven	7.7
17	Stara Zagora	22.8	Stara Zagora	27.6	Stara Zagora	36.0
18	Yambol	-	Yambol	13.4	Yambol	16.7
19	Kardzhali	8.9	Kardzhali	11.8	Kardzhali	14.2
20	Pazardzhik	-	Pazardzhik	-	Pazardzhik	-
21	Plovdiv	60.2	Plovdiv	82.8	Plovdiv	109.3
22	Smolyan	11.1	Smolyan	34.7	Smolyan	40.8
23	Haskovo	-	Haskovo	1.8	Haskovo	2.7
24	Blagoevgrad	49.8	Blagoevgrad	60.4	Blagoevgrad	79.0
25	Kyustendil	-	Kyustendil	-	Kyustendil	-
26	Pernik	1.0	Pernik	7.0	Pernik	1.0
27	Sofia district	34.4	Sofia district	49.3	Sofia district	34.5
28	Sofia (capital)	118.7	Sofia (capital)	105.2	Sofia (capital)	128.1

Source: Compiled under an information by “Education in the Republic of Bulgaria, 2010-2017”, NSI, Regional Review; “Population-Demography, Migration and Forecasts”, NSI, Infostat.

The indicated territorial differences by region are more clearly manifested by the breakdown of information by districts of the country (see table 13). Districts that are shaped as university centres are clearly outlined. Their net odds, i.e. student enrollment exceeds 100%, being significantly higher in 2017 compared to 2010 and 2013. This trend is most pronounced in the districts of Veliko Turnovo and Gabrovo – respectively by 109.3% and 132.3% increased to 186.5% and from 80.7% and 105.7% to 167.5%. A similar trend is observed for large regional centres such as Varna, Plovdiv and Sofia (the capital), as for the capital the value of the net coefficient was changed from 118.7% in 2010 to 105.2% in 2013 and 128.1% in 2017. Obviously, in the highlighted districts with a net student enrollment/enrollment ratio above the 100% benchmark, more students are enrolled and educated compared to the local population aged 20-24. That in these districts, it is necessary to redirect budgetary resources to provide innovative educational infrastructure, as well as the relevant social living environment of students.

In conclusion, it is important to note that in the last decade the number of students in Bulgaria and in other European countries has increased significantly. A number of measures have been implemented within the higher education system, in line with European requirements for an “increase” of the competitiveness and building a knowledge-based society and economy.

It is also necessary to point out that the network of universities and specialized higher education institutions in Bulgaria significantly exceeds the average indicators of a number of countries and territories comparable in terms of territory and population – Greece, Slovakia, Finland, Croatia, Czech Republic. In this context, it could be argued that the higher education system creates prerequisites and conditions for achieving a higher standard of living and quality of life. To this end, it is important that the process of expanding the educational infrastructure of higher education institutions be accompanied by the reconstruction of the existing facilities. Businesses and all spheres of society need highly educated individuals who carry high-tech innovative knowledge and professions.

4. Summarized assessment of the educational infrastructure

Of interest are the results of the summary assessment of the appropriate indicators chosen for the educational infrastructure with regard to the scope/access to education.

The specific summary assessment in the field of educational infrastructure is determined by measuring the aggregate impact of the following indicators:

- Proportion of children attending kindergartens in the population aged 3-6;
- Places for 100 children in kindergartens;
- Proportion of students in primary and secondary schools in the population aged 7-19;
- Proportion of drop-out students in I-VIII grades;
- Proportion of students in the population aged 20-24.

The choice of these indicators to determine the overall assessment of the educational infrastructure correspond in the necessary level, to the basic parameters of education as an element of the standard of living. Summarized estimates are the arithmetic mean values of these indicators, expressed as percentages (see Chapter One). They measure the degree of distance of a given territorial unit from the reference value, which for educational infrastructure indicators represents their maximum value.

What are the territorial differences in the regions of the country according to the respective summarized estimates for education for 2010, 2013 and 2017 (Table 15).

Table 15

Summary assessment of educational infrastructure by region (%)

№	Regions	2010	Regions	2013	Regions	2017
1.	Southwestern	94.0	Southwestern	94.2	Southwestern	96.3
2.	Bulgaria	74.2	Northcentral	80.9	Northcentral	76.3
3.	Northcentral	73.7	Bulgaria	75.1	Bulgaria	75.1
4.	Northeastern	69.9	Southcentral	68.4	Northeastern	71.9
5.	Southcentral	68.9	Northeastern	68.4	Southcentral	65.6
6.	Southeastern	64.6	Southeastern	63.0	Northwestern	63.5
7.	Northwestern	56.3	Northwestern	60.9	Southeastern	59.7
	Coefficient of variation	17.7	Coefficient of variation	17.4	Coefficient of variation	18.3

Source: Own calculations under NSI data.

The ranking of the regions by the value of the summary assessment was carried out in descending order, as for the educational infrastructure the highest value reflects the most favourable overall assessment of the aggregate impact of the selected indicators of access to education.

The analysis of the values of the summaries of education assessments in a vertical plan by region and in a horizontal plan by year highlights the following important conclusions:

- The Southwestern region has the first place, both for the years 2010, 2013 and 2017, and throughout the entire surveyed period 2010-2017. The values of the summary estimates range from 94 to 96.3%, which shows, however, that there is a leading position in all indicators. The SWR has been a leader throughout the period, mainly in terms of higher education, as this area is a well-established university centre. In the period after 2013 there is an increase in the overall score (by 2.1 p.p), which is due to an improvement in its positioning in the most indicators. In 2017, the Southwestern region led by all indicators except the indicator evaluating places in kindergartens. It should be noted that the overall assessment of the SWR is with 20% higher than the average for the country, and with respect to other regions the differences range between 20 and 40%;
- There is a slight change in the positioning of the regions: the values of the NCR summaries in 2013 and 2017 exceed the summative estimates for Bulgaria, in a result of it this region took second place;
- With regard to SER, minimal changes in the values of the summary estimates by years of the study period are observed in the direction of their decrease – from 64.6% in 2010 to 63% in 2013 and to 59.7% in 2017. This fact places the SER at penult / last place in the ranking of regions. It is noteworthy that for the SORs, the values of the horizontal summary estimates increase from 56.3% in 2010 to 60.9% in 2013 and to 63.5% in 2017. Despite this positive trend, the SRA continues to have the lowest level of access to educational infrastructure.
- The low level of territorial differences between the regions by the values of their aggregate estimates also determines the low value of the coefficients of variation as indicators of territorial differences.

As a result of the above findings for the changes in the horizontal and vertical estimates, it can be concluded that they did not cause significant changes in the positioning of the regions.

Undoubtedly more interested and with a higher level of details are the summarized assessments by districts (Table 16).

Table 16

Summary assessment of educational infrastructure by districts (%)

№	Districts	2010	Districts	2013	Districts	2017
1.	Sofia (capital)	85.6	Sofia (capital)	82.8	Sofia (capital)	87.9
2.	Veliko Tarnovo	80.5	Veliko Tarnovo	81.0	Veliko Tarnovo	84.7
3.	Smolyan	76.7	Smolyan	78.6	Smolyan	82.7
4.	Blagoevgrad	76.1	Blagoevgrad	74.8	Gabrovo	82.2
5.	Varna	74.0	Gabrovo	73.6	Shumen	77.1
6.	Shumen	73.2	Ruse	72.6	Blagoevgrad	73.5
7.	Gabrovo	72.2	Shumen	71.1	Varna	72.0
8.	Plovdiv	71.6	Varna	68.2	Bulgaria	69.8
9.	Burgas	70.5	Razgrad	68.0	Plovdiv	68.4
10.	Ruse	68.5	Bulgaria	67.8	Sofia	68.0
11.	Bulgaria	68.4	Kardzhali	67.6	Pernik	67.7
12.	Kardzhali	67.6	Yambol	67.4	Kardzhali	67.4
13.	Pernik	66.6	Plovdiv	67.3	Kyustendil	67.4
14.	Sofia	65.6	Sofia	66.8	Ruse	66.0
15.	Razgrad	64.8	Pernik	66.4	Pleven	65.9
16.	Stara Zagora	64.0	Burgas	65.6	Vratza	65.3
17.	Yambol	63.2	Vratza	64.4	Yambol	65.2
18.	Kyustendil	61.4	Kyustendil	63.5	Lovech	64.6
19.	Vidin	61.3	Stara Zagora	62.3	Burgas	64.1
20.	Silistra	60.7	Vidin	61.3	Stara Zagora	63.2
21.	Montana	60.3	Pleven	60.7	Haskovo	58.9
22.	Pleven	59.8	Lovech	58.9	Razgrad	58.9
23.	Vratza	59.1	Montana	58.6	Silistra	58.7
24.	Haskovo	58.4	Silistra	58.5	Targovishte	57.6
25.	Dobrich	57.9	Haskovo	58.2	Montana	57.3
26.	Lovech	57.0	Dobrich	57.3	Dobrich	56.0
27.	Pazardzhik	54.4	Pazardzhik	53.9	Vidin	55.8
28.	Targovishte	53.8	Targovishte	53.5	Pazardzhik	51.8
29.	Sliven	45.3	Sliven	46.6	Sliven	47.5
	Coefficient of variation	13.6	Coefficient of variation	12.9	Coefficient of variation	15.0

Source: Own calculations under NSI data.

The analysis of the generalized grades for education by districts of the country reveals interesting facts about their rankings, as well as their grouping according to the magnitude of their generalized grades compared to those on average in Bulgaria:

- It is significant that the first three districts – Sofia (Capital), Veliko Tarnovo and Smolyan, in the order of the districts that have the highest values of the summary estimates, retain their positions in the three surveyed years. At the same time, their aggregate marks are gradually increasing throughout the surveyed period, and in 2017

the district of Sofia (Capital) reaches a value of the aggregate assessment of nearly 90%, thus making it the most important area for the stable development of the educational infrastructure;

- The second set of districts with aggregate values above the national average retain their core over the three surveyed years, as well as throughout the period 2010 -2017. These are mainly districts with relatively high levels of socio-economic development, as well as university education (Blagoevgrad, Varna, Gabrovo);
- The largest group (15) is the group of districts with generalized scores below the average for the country. Their values are in the range of about 68% – 58%. In fact, these are the areas whose aggregate estimates are between the national average and the so-called a critical threshold for the values of these estimates. The descending areas provide indicative information to local governing bodies on the need to create appropriate infrastructure to increase the scope and quality of education;
- Regarding the distribution of the regions with values of their specific aggregate estimates below the critical threshold, which ranges from 56.8 to 58.7% for the studied period, it is found that in their totality a solid core of the Pazardzhik, Targovishte and Sliven regions is observed. Obviously, this fact signals the need to direct the efforts of the competent local/state authorities to improve their educational infrastructure and also to enhance their overall socio-economic development. During the study period, the number of districts with values of aggregate estimates below the critical threshold increased, with the Montana, Vidin, and Dobrich districts joining them in individual years.
- Particular attention should be paid to the district of Sliven, whose values of generalized estimates are too low – between 46% and 48%. These values put Sliven region on the last place in the ranking of districts. Maintaining such low values of the summative assessments throughout the study period makes it very clear that the education system in the district of Sliven is subject to "emergency intervention", which will ensure an increase in the scope and quality of training. Given the ethnic structure of its population, other specific and specific policies and measures to overcome the high degree of differentiation are clearly required;
- It is noted that the differentiation between the areas for the study period decreased, as evidenced by the values of the coefficients of variation, which range from 13 to 15%.

The specific conclusions drawn about the changes in the summary estimates by region and region allow us to draw the following main conclusion:

The territorial differences in a vertical and horizontal plan, between the values of specific summaries clearly rank their importance as targets for targeting relevant socio-economic policies and reforms in the education system and in particular in the educational infrastructure.

Summary conclusions

The comparative analyzes and evaluations carried out in the territorial profile revealed the extent of regional differences in the coverage of children/students in the educational infrastructure across the three levels of education.

Preschool education

- The analysis of the changes by years of the surveyed period (2010-2017) shows that the average for the period changes for all regions are in a positive direction; the highest incidence of children is in the Southwestern region (83%), followed by the Northwestern region with the prestigious 80% range, which is impressive in view of the overall comparatively less developed development of this region;
- It is concluded that the territorial differences in the regions of the country are insignificant and have not caused any significant changes in time;
- The analysis of the coverage of children by districts registers a consistent annual increase in the values of the respective net coefficients in nearly 90% of the districts;
- The ranking of districts by 2017 by the values of the “Place for 100 children” indicator reveals the totality of three main districts (Plovdiv, Varna and Sofia-Capital), in which they are below the “reference threshold”, but with insignificant differences.

School education

- The ranking by region of the country ranked the Southwestern region in the first place during the whole surveyed period;
- With regard to other areas, changes in student reach do not lead to noticeable territorial differences;
- The ranking of the regions by the magnitude of the net coefficients finds that their values are at a range of 15%, which is predetermined by the occupied first place by Sofia-Capital with a high net coefficient – nearly 90%;
- This fact is due to the increasing influx of students in the capital, noting that they are mainly from primary education; it is obviously necessary to ensure the improvement and development of its educational base;
- The relatively low values of the net coefficients below 80% for the districts of Silistra, Pazardzhik, Sliven, Targovishte are conditioned by the decrease in the number of students in all three levels of education;
- The main reason for reducing the number of students is leaving out/dropping out of school. The analysis of the impact of this factor reveals the three main reasons for leaving: unwillingness, family reasons, and going abroad. The highest is the number of students enrolled abroad from primary education;

- At the beginning of the study period, the “Family reasons” group emerged as the first in importance. During the period 2010-2017, a process of reducing the impact of these causes is gradually being started at the expense of increasing the impact of the reason “Departed abroad”.

Higher education

- The analysis and evaluations of the higher education's educational infrastructure are to some extent conditional on its specific characteristics, namely that higher education is optional;
- It is more correct for the higher education system to use not the notion of "student scope" but rather to introduce a new concept of "coverage of population in the age group 20-24 in the higher education system";
- As a result of the evaluations, it was found appropriate to reduce the expansion of already established university centres by redirecting funds to more backward areas and areas, such as the Northwestern region; this process will give impetus to the development of the area not only in educational aspect but also in economic, social and spiritual terms.

To summarize the specific development **policies** proposed in the study and the specific changes in the different levels of education related to the respective educational infrastructure, the following major policy directions could be systematized:

Preschool education

- Policies to make fuller use of the available educational infrastructure in order to increase net odds values, i.e. the reach of children in kindergartens. These policies should be of a differentiated nature and aim at limiting/eliminating the impact of regional causes that have led to lower attendance at kindergartens;
- Policies to reinforce the fundamental nature of the objectives of pre-school education, namely to ensure that children move smoothly into the next educational stage – primary education. The main factor for achieving this goal is the removal of the language barrier, respectively the command of the official Bulgarian language, which implies a fuller coverage of children from ethnic communities, as well as the implementation of appropriate forms for its learning;
- Policies to cover all children, and especially Roma children from early childhood, in the system of childcare facilities for upbringing, behaviour and education. In doing so, it is necessary to ensure regular attendance at childcare facilities by children whose parents do not have or have a low educational level, i.e. these parents are unable to educate and provide a quality environment for their children's education.

School education

- implementation of regional policies to limit the reasons for the incomplete reach of students in the age group of 7-19 years;
- policies to regulate the flow of students to the larger district centres, and in particular to Sofia (Capital). Implementing student retention policies in areas where there is a high tide, creating an appropriate educational infrastructure to suit their educational preferences;
- specific policies for young families with primary school children who register the highest inflow to larger district centres;
- a system of appropriate policies to limit/eliminate the "drop out" phenomenon. They should aim at eliminating the reasons behind his "placement" in the school education;
- a package of policies targeting the families of children who have left school for family reasons, which have the greatest weight in all districts except Sofia (Capital). When conducting them, it is important to take into account not only the reasons of socio-economic nature, but also such as family motivation and value orientation.

Higher education

- policies for changes in the structure and quality of the higher education infrastructure in the regional aspect;
- policies to ensure a dynamic link between the educational profiles of training and the demand on the labour market for highly educated professionals at European level;
- policies for the creation and development of higher education infrastructure, tailored to the specific characteristics of relatively less deprived areas (Northwestern region), directly linked to current and future local business profiles in order to achieve noticeable changes in the standard and quality of life of the population in this region.

Obviously, in all three levels of education, there are important problems related to the development of their educational infrastructure, which requires the development and implementation of effective policies for its improvement, modernization and expansion in accordance with the contemporary requirements for achieving innovative education and, respectively, high-tech economic development and the society.

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