Prevalence of overweight and obesity among Albanian children (6-15 years old) living in the Balkan region 2013-2015

REPORT I

Juel Jarani[(1)], Andi Spahi[(1)], Florian Muca[(3; 4)], Dean Qefalia, Jakob Tarp[(2)], Anders Groentved[(2)], Agron Kasa[(1)], Leornard Shaka[(4)], Keida Ushtelenca[(1)]

1- *Sports University of Tirana*
2- *University of Southern Denmark*
3- Tirana International School
4- *ASSA organization (ex BSHRC)*

BASIC project "Balkan Survey of Inactivity in Children "

2013-2015

Cite:

Jarani, J., Spahi, A., Muca, F., Qefalia. D., Tarp, J., Grøntved, A., Kasa, A., Shaka, L., & Ushtelenca, K. (2015). Prevalence of overweight and obesity among Albanian children (6-15 years old) living in the Balkan region 2013-2015. *Report I*, 1- 42.

Contents

Info about BASIC project

The BASIC project "Balkan Survey of Inactivity in Children" is a project applied and approved at the University of Sports of Tirana (UST) and financed from the budget "on Financing of Scientific Research" agreed by the Ministry of Education, Sports and Youth.
The report is based on data on obesity (report I), eating behavior, movement mode (report II) and physical activity (report III), in Albanian children (18500 children) living in the Balkans (Albania, Kosovo, Macedonia, Montenegro). The duration of the measurements and the analysis of the data belong to the period 2013-2015. There was extensive cooperation with the DAR of the cities in Albania, the respective municipalities in Kosovo and Macedonia as well as the Ministry of Education and Sports of Montenegro.
The working group of this project consists of the academic staff of UST, members of the non-profit association ASSA (formerly BSHRC) as well as two professors Jakob Tarp and Anders Groentved from the University of Southern Denmark. The staff of this project is also engaged in statistical analysis, the creation of the Balkan database of overweight/obesity, as well as the creation of standard references of weight, height, BMI and waist circumference for Albanian children living in the Balkans (6-15 years old).

This report, developed for the first time in the Region and in Albania, includes the creation of a map of physical activity participation, the spread of obesity and overweight, and participation in physical and sports activities among school children aged 6-15 years (primary and lower secondary). As part of this project, a computer program/application (web based, apps) has been built where parents, teachers and individuals can identify the status of their children by providing only the child's age data and parameters (weight, height, BMI and waist circumference).

Children are now able to create a profile of their current status in relation to Albanian children as a whole. Comparative data have also been created: city-village, boy-girl, comparison between countries, geographical location, primary-lower secondary, between age groups (0.5-year separation) from 6-15 years.

The innovation of the BASIC project is the creation of references of Albanian children to calculate overweight and obesity data using body mass index (BMI) parameters measured in Albanian children. For the first time in Albania, the BASIC project identifies overweight and obese children living in the Balkans as well as in the respective countries studied

(note: the BASIC project's age-specific BMI percentiles were used to calculate overweight and obesity).

Details of the number of children and schools participated into the project

Cities, according to the definition of the same law, are residential centers that have an approved perspective urban development plan. The declaration of a city is made by law.

Rural population: It consists of the population whose primary activity is overwhelmingly agriculture, forestry or fishing. In Albania, a residential center is classified as a village when it has more than 200 inhabitants. Among the largest regions and areas/cities where children were measured are;

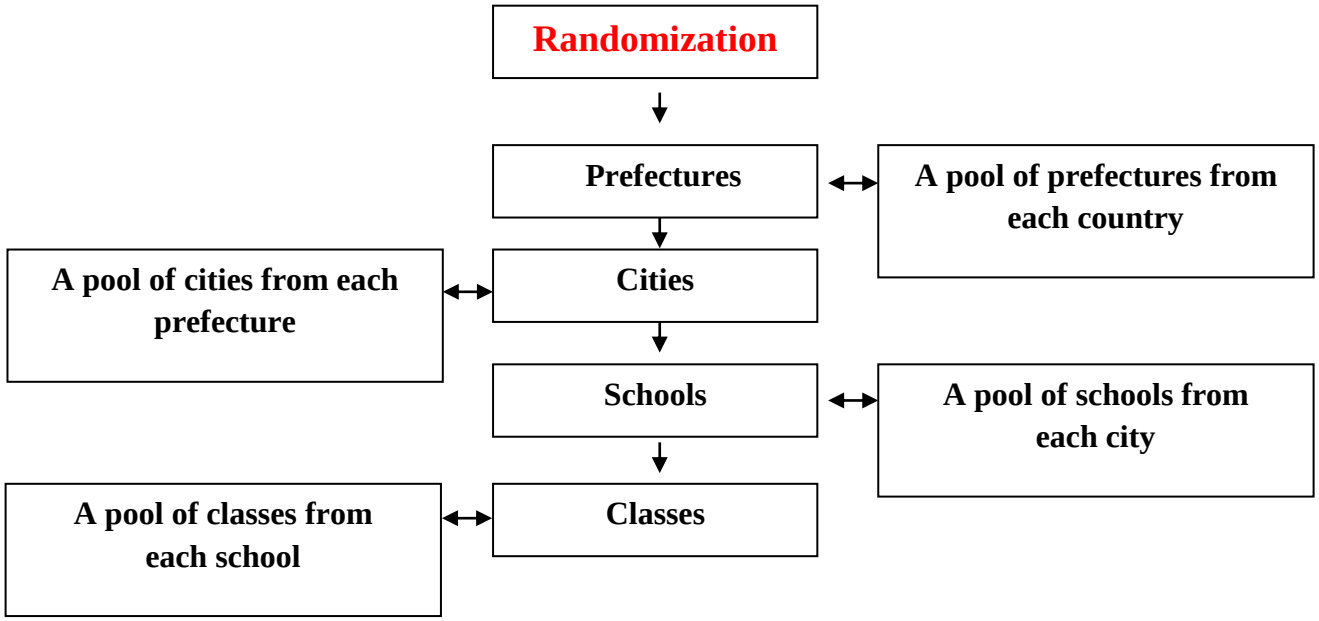
Albania- Tiranë, Shkodër, Sarandë, Lushnje, Dibër,

R. Kosovo- Prishtinë, Prizren, Kaçanik, Ferizaj, Mitrovicë,

FYR Macedonia- Dibër e Madhe, Shkup, Tetovë, Strugë, Ohër

Montenegro- Ulqin, Vlodimir, Tuz, Krajë, Shtoj

Selection of the school and participants scheme for Albania, Kosovo, FYR Macedonia and Montenegro



Sample selection phase

A three-stage sampling cluster design was used during sample selection in Albania; a two-stage sampling was used for Kosovo and one stage sampling cluster design for Macedonia and Montenegro.

Albania

First- 5 prefectures/regions were randomly selected from a random number table from a pool of12 prefectures/ regions.

Second- 5 cities (1 city for each prefectures/districs) were randomly selected from a random number table from a pool of two-three cities for each prefecture/district.

Third- schools were randomly selected from a random number table stratified by age groups (grades).

Kosovo

First- 5 cities/municipalities were randomly selected from a random number table from a pool of thirty cities/municipalities.

Second- schools were randomly selected from a random number table stratified by age groups (grades).

FYR Macedonia

First- schools were randomly selected from a random number table stratified by age groups (grades) in those cities (5 cities/ villages) where live in majority Albanian children.

Montenegro

First- schools were randomly selected from a random number table stratified by age groups (grades) in those cities (5 cities/ villages) where live in majority Albanian children.

Participation of children in the project

The following tables present data on the participation of children (N) in the respective countries, broken down by gender (boys, girls), location (urban and rural areas) and the level of school they attend (primary, lower secondary).

Descriptive statistics for the children participation into the project by gender and country

Individual countries	n	Boys	Girls
Albania	9735	4867	4868
Kosovo	4163	2064	2099
FYR Macedonia	2886	1442	1444
Montenegro	1676	893	783

Descriptive statistics for the children participation into the project by gender, country and location

Individual countries (Urban/Rural)		n	Boys	Girls
Albania	Urban	8228	4094	4134
	Rural	1507	773	734
Kosovo	Urban	3437	1693	1744
	Rural	726	371	355
FYR Macedonia	Urban	2663	1322	1341
	Rural	223	120	103
Montenegro	Urban	1188	644	544
	Rural	488	249	239

Descriptive statistics for the children participation into the project by gender, country and school level

Individual countries (school-level)		n	Boys	Girls
Albania	elementary school	5074	2550	2524
	secondary school	3983	1991	1992
Kosovo	elementary school	2547	1262	1285
	secondary school	1616	802	814
FYR Macedonia	elementary school	1698	859	839
	secondary school	1188	583	605
Montenegro	elementary school	886	475	411
	secondary school	790	418	372

Methods

The reference curves were based on the LMS method (Cole 1990) using the software LMS chartmaker (LMS Pro version 1.16, Institute ofChild Health, London). The LMS method summarizes the distribution of the dependent variable by itsmedian (M) and coefficient of variation (S), plus a measure of skewness based on the Box-Cox power (L) required totransform the data to normality. These three quantitiesdepend on age and sex and are modelled using penalized likelihood as cubic splines by non-linear regression. L values of 1 indicate absence of skewness in the distribution, while 0 is the log transformation and -1 is the invers transformation (more skewed than log-normal). A normal distribution is assumed following LMS transformation. When a variable follows a normal distribution z-scores can be used interchangeably with centiles. Therefore, using L, M and S values, adependentvariable (y) can be converted to Z -scores according to the formulas:

$$z = \frac{\left(\frac{y}{M}\right)^{L}}{LS}, \quad L \neq 0$$

$$z = \frac{log_e(\frac{y}{M})}{s} \quad , \quad L = 0$$

And to centiles using the formula:

$$c = M(1 + LSz)^{1/L}$$

L, M and S parameters were exported at 0.5 year intervals for each sex. Based on these quantities, centiles curves corresponding to the 3rd, 10th, 25th, 50th 75th90th and the 97th percentile were calculated for height, weight, body-mass index (BMI) and waist-circumference for each sex. We further calculated the 85thand the 95th percentiles for BMI and used these to define cut-offs for overweight and obesity, respectively. By this definition, the prevalence of overweight (including obesity) is 15% and the prevalence of obesity is 5%. Goodness of fit was examined using worm-plots (Van Buuren and Fredriks 2001) and by examining empirical vs. observed centiles (i.e. 90th centile included 90% of observations). For each dependent variable we identified the number of smoothing parameters for L, M and S which gave the best possible fit (lowest deviance) based on the generalized Akaike's information criteria (GAIC(3)) and still created smooth centile curves (i.e. did not over-fit the curves).

Information on anthropometric data was available in 18448 (waist-circumference) to 18512 (weight) individuals. Of the 19850 invited, 297 had declined participation, 419 were not included as their sex-age group was too small (covering 6 cells) and 534 had no information on either age, gender or any anthropometric variable. At least 200 observations in a 0.5 year sex-age group were required to include the cell (Wang, Moreno et al. 2006). Data was manually screened which lead to exclusion of 23 observations on weight, 34 on waist-circumference and 54 for height. After calculation of BMI, further 34 observations were dropped as the BMI was below 12 kg/m^2. This is considered unlikely (i.e. error in one or more measurements) or indicating extreme malnutrition. Dropped observations amounted to <0.5% of the included data. The included sample was between 6.3 and 15.7 years old.

Overweight and obesity in children

The overweight and obesity data of Albanian children obtained from measurements performed by the project staff (body weight and height) were calculated according to the project references BASIC (Albanian Reference)

Definitions:

1. BASIC Albanian reference:

Overweight- ≥85th percentile (Albania, Kosovo, FYR Macedonia and Montenegro)

Obesity- ≥95th percentile (Albania, Kosovo, FYR Macedonia and Montenegro)

Results

Prevalence of overweight and obesity in Albanian children living in the Balkans

The data from table 1 present the total number of Albanian children (6.5-15.5 years old) who participated in this project selected in the four Balkan countries (Albania, Kosovo, Macedonia and Montenegro). In total, 18460 children (9266 boys and 9194 girls) participated. Of the total number of children, 15,516 children living in urban areas (7,753 boys and 7,763 girls) and 2,944 children living in rural areas (1,513 boys and 1,431 girls) participated in the study.

Table 1 Descriptive statistics for the children participation into the project by gender and location

	n	Boys	Girls
Balkan	18460	9266	9194
Urban	15516	7753	7763
Rural	2944	1513	1431

The prevalence in the Balkans (table 2) of overweight children is 10.3% (10.9% boys and 9.7% girls) and obese children 5.7% (5.9% boys and 5.5% girls). The data show that boys constitute the highest percentage compared to girls in both overweight and obesity. At the area level, the highest prevalence of overweight is in urban areas with 11% and obesity with 6%. The data show that the lowest prevalence of overweight and obesity is in girls living in rural areas in the Balkans with 6.2% and 3.8%, respectively.

Facts:

In the Balkans 10.3% of Albanian children are overweight

In the Balkans 5.7% of Albanian children are obese.

Boys are more obese and overweight than girls.

Boys and girls living in rural areas have the lowest prevalence of overweight and obesity.

Table2 Prevalence of overweight and obesity in Balkan among boys and girls, by location

	Overweight (%)			Obese (%)		
	Total	Boys	Girls	Total	Boys	Girls
Balkan	10.3	10.9	9.7	5.7	5.9	5.5
Urban	10.9	11.5	10.4	6.0	6.2	5.9
Rural	6.8	7.3	6.2	4.3	4.7	3.8

Estimates of overweight and obesity is based on Albanian reference population- BASIC.

At the country level (table 3), Montenegro has the highest prevalence of overweight with 14.9% and obesity with 10.2%. Kosovar boys have the lowest prevalence of overweight with 7.3% and obesity with 3.3% compared to boys living in other countries. The same picture is for girls where they have the lowest prevalence of overweight with 6.3% and obesity with 3.3% compared to girls living in other countries.

Facts:

Montenegrin children are the most overweight and obese in the Balkans.

Children from Kosovo have the lowest prevalence of overweight and obesity.

Macedonian girls are more overweight than boys.

Table 1 Prevalence of overweight and obesity in Balkan among boys and girls, by countries

	Overweight (%)			Obese (%)		
Individual countries	Total	Boys	Girls	Total	Boys	Girls
Albania	10.87	11.53	10.21	5.66	5.77	5.55
Kosovo	6.80	7.32	6.29	3.34	3.34	3.33
FYR Macedonia	10.74	9.92	11.57	6.83	7.07	6.58
Montenegro	14.92	16.91	12.64	10.20	10.86	9.45

Estimates of overweight and obesity is based on Albanian reference population- BASIC.

The most overweight children (16.9%) in the Balkans are Montenegrin boys (table 4) living in urban areas, and the most obese (14.9%) are boys living in rural areas of Montenegro. The lowest prevalence of overweight is found in boys (3.4%) and girls (0.8) in Kosovo living in rural areas. Unlike other children in the Balkans, Macedonian boys living in rural areas have a higher prevalence of overweight than those living in urban areas.

Facts:

Montenegrin children living in urban areas have a higher prevalence of overweight (15.2%)

Macedonian girls are the most overweight with a prevalence of 12.08%.

Boys in Macedonia living in rural areas are more overweight than those living in urban areas.

Table 2 Prevalence of overweight and obesity in Balkan among boys and girls, by countries and location

Individual countries (Urban/Rural)		Overweight (%)			Obese (%)		
		Total	Boys	Girls	Total	Boys	Girls
Albania	Urban	11.81	12.60	11.03	6.28	6.35	6.22
	Rural	5.71	5.82	5.59	2.26	2.72	1.77
Kosovo	Urban	7.51	8.27	6.77	3.84	3.90	3.78
	Rural	3.44	2.96	3.94	0.96	0.81	1.13
FYR Macedonia	Urban	10.97	9.83	12.08	6.72	6.96	6.49
	Rural	8.07	10.83	4.85	8.07	8.33	7.77
Montenegro	Urban	15.15	16.93	13.05	8.75	9.32	8.09
	Rural	14.34	16.87	11.72	13.73	14.86	12.55

Estimates of overweight and obesity is based on Albanian reference population- BASIC.

Unlike other Balkan countries, Macedonian girls (table 5) who attend primary schools are more overweight than their male peers, but this does not apply to those students who attend lower secondary schools. The opposite is true for obesity, where Macedonian boys

who attend primary schools are more obese than girls, while girls who attend lower secondary schools are more obese than boys. An interesting fact appears to be the high prevalence of obesity among Kosovar girls in primary grades compared to that of boys.

Facts:

Children in Montenegro in primary education are more overweight with a prevalence of 16.3%.

Compared to other Balkan countries, Macedonian girls who attend lower secondary education are more overweight and obese than those who attend primary education.

Table 3 Prevalence of overweight and obesity in Balkan among boys and girls, by countries and school level

Individual countries (school-level)		Overweight (%)			Obese (%)		
		Total	Boys	Girls	Total	Boys	Girls
Albania	elementary school	11.61	12.08	11.13	6.13	6.35	5.90
	secondary school	9.74	10.65	8.84	4.95	4.82	5.07
Kosovo	elementary school	6.56	7.29	5.84	3.38	3.33	7.00
	secondary school	7.18	7.36	3.42	3.28	3.37	3.19
FYR Macedonia	elementary school	9.54	8.15	10.97	6.83	7.57	6.08
	secondary school	12.46	12.52	12.40	6.82	6.35	7.27
Montenegro	elementary school	16.25	17.05	15.33	13.42	10.32	9.73
	secondary school	10.05	16.75	9.68	10.38	11.48	9.14

Estimates of overweight and obesity is based on Albanian reference population- BASIC

Table 6 presents the prevalence of overweight and obesity among Albanian children living in the Balkans. The prevalence of overweight in urban areas is 11% and that of obesity is 6. %. The prevalence of overweight in rural areas is 6.8 % and that of obesity is 4.3%.

Facts:

In the Balkans, 10.3% of Albanian children are overweight, compared to 5.7% of those who are obese.

Children living in urban areas are more overweight and obese than those living in rural areas.

Table 4 Prevalence of overweight and obesity in Balkan among children, by location

	n	Overweight (%)	Obese (%)
Balkan	18460	10.30	5.73
Urban	15516	10.97	6.01
Rural	2944	6.76	4.28

Estimates of overweight and obesity is based on Albanian reference population- BASIC

Table 7 presents the prevalence of overweight and obesity at the country level among Albanian children living in the Balkans. The table shows that Albanian children have a higher prevalence of overweight than obesity.

Facts:

The highest percentage of overweight (14.9%) and obesity (10.2%) is found in Albanian children in Montenegro.

The lowest prevalence of overweight (6.8%) and obesity (3.3%) is found in children in Kosovo.

Table 5 Prevalence of overweight and obesity in Balkan among children, by countries

Individual countries	n	Overweight (%)	Obese (%)
Albania	9735	10.87	5.66
Kosovo	4163	6.80	3.34
FYR Macedonia	2886	10.74	6.83
Montenegro	1676	14.92	10.20

Estimates of overweight and obesity is based on Albanian reference population- BASIC

Overall, the prevalence of obesity in children living in urban areas is higher than that in children living in rural areas (Table 8). An interesting finding is that Albanian children in Macedonia and Montenegro living in urban areas have a lower prevalence of obesity

than those living in rural areas. The prevalence of obesity in Albanian and Kosovar children living in urban areas is higher than that in children living in rural areas.

Facts:

The prevalence of obesity in Montenegrin children living in urban areas is lower than that in those living in rural areas.

Children living in urban areas are more overweight.

Table 6 Prevalence of overweight and obesity in Balkan among children

Individual countries (Urban/Rural)		n	Overweight (%)	Obese (%)
Albania	Urban	8228	11.81	6.28
	Rural	1507	5.71	2.26
Kosovo	Urban	3437	7.51	3.84
	Rural	726	3.44	0.96
FYR Macedonia	Urban	2663	10.97	6.72
	Rural	223	8.07	8.07
Montenegro	Urban	1188	15.15	8.75
	Rural	488	14.34	13.73

Estimates of overweight and obesity is based on Albanian reference population- BASIC

Unlike children in Kosovo and Macedonia, children in Albania and Montenegro in primary schools have a higher prevalence of overweight than those in lower secondary schools (table 9). The same cannot be said for obesity, as children in primary schools have a higher prevalence than those in lower secondary schools.

Facts:

The highest prevalence of overweight (16.3%) and obesity (13.4%) are children in primary schools in Montenegro.

The least overweight (6.6%) are Kosovar children in primary schools and the least obese (3.3%) are Kosovar children in lower secondary schools.

Table 7 Prevalence of overweight and obesity in Balkan among children, by countries and school level

Individual countries (school-level)		n	Overweight (%)	Obese (%)
Albania	elementary school	5074	11.61	6.13
	secondary school	3983	9.74	4.95
Kosovo	elementary school	2547	6.56	3.38
	secondary school	1616	7.18	3.28
FYR Macedonia	elementary school	1698	9.54	6.83
	secondary school	1188	12.46	6.82
Montenegro	elementary school	886	16.25	13.42
	secondary school	790	10.05	10.38

Estimates of overweight and obesity is based on Albanian reference population- BASIC

Comparison of the prevalence of overweight and obesity according to calculations from BASIC, IOTF and WHO references

The calculation of data (overweight and obesity) of Albanian children obtained from measurements performed by project staff (body weight and height), in the tables below is calculated according to 3 references; Albanian reference (BASIC), International Obesity Task Force (IOTF) and World Health Organisation (WHO).

Definitions:

1. BASIC Albanian reference:

Overweight- ≥85th percentile (Albania, Kosovo, FYR Macedonia and Montenegro)

Obesity- ≥95th percentile (Albania, Kosovo, FYR Macedonia and Montenegro)

2. **International Obesity Task Force (IOTF)**

Overweight- Percentile corresponding to BMI of 25 at 18 years (UK, US, Brazil, Singapore, Holland, Hong Kong)

Obesity- Percentile corresponding to BMI of 30 at 18 years (UK, US, Brazil, Singapore, Holland, Hong Kong)

3. **World Helth Organisation (WHO)**

Overweight- ≥1 SD / 84.13th percentile (NCHS ´77 population (US)

Obesity- ≥2 SD / 97.73th percentile (NCHS ´77 population (US)

Table 10 presents the prevalence of overweight and obesity using body mass index (BMI) data of Albanian children living in the Balkans. For their calculation, 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used. From the data in the table in the three references (BASIC, IOTF and WHO) it is seen that with the same database of Albanian children's

BMI, different conclusions are presented on the prevalence of overweight and obesity. In the Balkans, 5.7% of children are obese and 10.3% are overweight (the BMI percentiles for age of Albanian children "BASIC" were used in the calculation).

Using the BMI percentiles for age of non-Albanian children (IOTF and WHO) in the calculation, we conclude that: 5.2% are obese (IOTF) and 15.6% are overweight (IOTF) while 9.9% are obese (WHO) and 18.2% are overweight (WHO).

Facts:

Overall in the Balkans, children living in urban areas have a higher prevalence of overweight and obesity compared to those living in rural areas.

The lower obesity rate (5.2%) was derived using IOTF data.

Table 8 Prevalence of overweight and obesity in Balkan among children, by location

		Albanian reference population BASIC		International Obesity Task Force		WHO	
	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Balkan	18460	10.30	5.73	15.58	5.20	18.23	9.88
Urban	15516	10.97	6.01	16.37	5.50	18.91	10.42
Rural	2944	6.76	4.28	11.41	3.63	14.67	7.07

Estimates based on Albanian reference population- BASIC, IOTF and WHO

The prevalence of overweight and obesity of Albanian children living in the Balkans (disaggregated by country) using child body mass index (BMI) data is presented in Table 11. WHO data shows that Albanian children have a higher prevalence of overweight and obesity compared to the calculation of BMI percentiles according to BASIC and IOTF.

Facts:
Children in Montenegro have a higher prevalence of overweight and obesity referred to IOTF and WHO.
Children in Kosovo have the lowest prevalence of obesity (3.07), which was calculated using IOTF BMI percentiles.

Table 9 Prevalence of overweight and obesity in Balkan among children, by countries

		Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	9735	10.87	5.66	16.35	5.16	19.16	10.14
Kosovo	4163	6.80	3.34	10.69	3.07	14.15	5.77
FYR Macedonia	2886	10.74	6.83	16.32	6.03	18.75	10.40
Montenegro	1676	14.92	10.20	21.96	9.31	22.14	17.72

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Three BMI-for-age percentiles (Albanian reference population BASIC, IOTF, WHO) were used to calculate the prevalence of overweight and obesity in Albanian children living in the Balkans, divided into urban/rural areas for each country (table 12). The data show that the most overweight children are from Montenegro living in rural areas, considering the WHO references.

Facts:

Kosovar children have the lowest prevalence in the Balkans.

Children living in rural areas are less overweight and obese than those living in urban areas.

Macedonian children living in rural areas have the same prevalence of overweight and obesity (8.1%) referred to the BASIC percentiles.

Table 10 Prevalence of overweight and obesity in Balkan among children, by countries and location

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries	(Urban/Rural)	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	Urban	8228	11.81	6.28	17.53	5.79	20.10	11.23
	Rural	1507	5.71	2.26	9.95	1.73	14.00	4.18
Kosovo	Urban	3437	7.51	3.84	11.73	3.58	15.13	6.55
	Rural	726	3.44	0.96	5.79	0.69	9.50	2.07
FYR Macedonia	Urban	2663	10.97	6.72	16.30	5.86	18.70	10.18
	Rural	223	8.07	8.07	16.59	8.07	19.28	13.00
Montenegro	Urban	1188	15.15	8.75	21.97	8.25	22.05	16.50
	Rural	488	14.34	13.73	21.93	11.89	22.34	20.70

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Table 13 presents the prevalence of overweight and obesity obtained from the calculations of the 3 BMI percentiles (Albanian reference population- BASIC, IOTF, WHO) for primary and lower secondary schools. Kosovar children attending primary school are the least overweight (6.6%) in the Balkans, while the least obese (3.3%) are again Kosovar children attending lower secondary school (in all three calculations). The most overweight (16.3%) and obese (13.4%) are Montenegrin children attending primary school (in all three calculations)

Facts:
The most overweight children (according to WHO references) are those from Montenegro attending lower secondary school.
Albanian and Montenegrin children attending primary school are more overweight and obese than those attending lower secondary school.
Children in Kosovo and Macedonia who attend primary school are less overweight and less obese than those in lower secondary schools.

Table 11 Prevalence of overweight and obesity in Balkan among children, by countries and school level

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries (school-level)		n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	elementary school	5074	11.61	6.13	16.30	6.33	19.29	12.26
	secondary school	3983	9.74	4.95	16.02	3.57	18.63	7.05
Kosovo	elementary school	2547	6.56	3.38	9.50	3.57	12.76	6.75
	secondary school	1616	7.18	3.28	12.56	2.29	16.34	4.21
FYR Macedonia	elementary school	1698	9.54	6.83	14.13	6.95	16.55	11.25
	secondary school	1188	12.46	6.82	19.44	4.71	21.89	9.18
Montenegro	elementary school	886	16.25	13.42	22.57	10.16	22.01	20.43
	secondary school	790	10.05	10.38	21.27	8.35	22.28	14.68

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Prevalence of overweight and obesity in Albanian children (boys) living in the Balkans

Table 14 presents the prevalence of overweight and obesity in Albanian children (boys) living in the Balkans. The total number of boys measured in the Balkans is 9266, of which 7753 live in urban areas and 1513 in rural areas.

Facts:

In total, 10.9% of boys are overweight and 5.9% are obese.

Boys living in urban areas are 11.5% more overweight and 6.2% more obese than those living in rural areas.

Table 12 Prevalence of overweight and obesity in Balkan among boys, by location

	n	Overweight (%)	Obese (%)
Balkan	9266	10.86	5.92
Urban	7753	11.54	6.17
Rural	1513	7.34	4.69

Estimates based on Albanian reference population- BASIC

The prevalence of overweight and obesity by Balkan country in children (boys) is presented in Table 15. The number of boys measured in Albania is 4867, Kosovo 2064, Macedonia 1442 and Montenegro 893 boys.

Facts:

The most overweight 16.9% and the most obese 10.86% are boys from Montenegro.

11.5% of Albanian boys are overweight.

Kosovar boys are less overweight and obese than their Albanian peers.

Table 13 Prevalence of overweight and obesity in Balkan among boys, by countries

Individual countries	n	Overweight (%)	Obese (%)
Albania	4867	11.53	5.77
Kosovo	2064	7.32	3.34
FYR Macedonia	1442	9.92	7.07
Montenegro	893	16.91	10.86

Estimates based on Albanian reference population- BASIC

Table 16 presents the prevalence of overweight and obesity in Albanian children (boys) divided by country and area of residence. Montenegrin boys living in urban areas are the most overweight, with a prevalence of 16.9%, while boys from Kosovo living in rural areas are the least overweight with a prevalence of 3%. Montenegrin boys living in rural areas are the most obese with a prevalence of 14.9%, while Kosovo boys living in rural areas are the least obese with a prevalence of 0.8%.

Facts:

Boys living in rural areas in Macedonia are more overweight and obese than those living in urban areas.

Montenegrin boys living in rural areas (14.9%) are more obese than those living in urban areas (9.3%).

Table 14 Prevalence of overweight and obesity in Balkan among boys, by countries and location

Individual countries (Urban/Rural)		n	Overweight (%)	Obese (%)
Albania	Urban	4094	12.60	6.35
	Rural	773	5.82	2.72
Kosovo	Urban	1693	8.27	3.90
	Rural	371	2.96	0.81
FYR Macedonia	Urban	1322	9.83	6.96
	Rural	120	10.83	8.33

Montenegro	Urban	644	16.93	9.32
	Rural	249	16.87	14.86

Estimates based on Albanian reference population- BASIC

The prevalence of overweight and obesity in Albanian boys by school level is presented in Table 17. The highest number of measurements was made in primary schools. Kosovar boys attending primary school are less overweight and less obese than those attending lower secondary school. The opposite is true for Albanian boys, where it is observed that the most overweight and obese are boys attending primary school.

Facts:

Montenegrin boys attending primary school are the most overweight with a prevalence of 17.1%, while Montenegrin boys attending lower secondary school are the most obese.

In Macedonia, the most overweight are boys attending lower secondary school and the most obese are those attending primary school.

Table 15 Prevalence of overweight and obesity in Balkan among boys, by countries and school level

Individual countries (school-level)		n	Overweight (%)	Obese (%)
Albania	elementary school	2550	12.08	6.35
	secondary school	1991	10.65	4.82
Kosovo	elementary school	1262	7.29	3.33
	secondary school	802	7.36	3.37
FYR Macedonia	elementary school	859	8.15	7.57
	secondary school	583	12.52	6.35
Montenegro	elementary school	475	17.05	10.32
	secondary school	418	16.75	11.48

Estimates based on Albanian reference population- BASIC

Table 18 shows the prevalence of overweight and obesity in Albanian boys living in the Balkans, divided by the areas where they live. For their calculation, 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used. Using the IOTF percentiles of BMI by age of Albanian children in the calculation, we conclude that 16.5% of boys in the Balkans are overweight and 6.2% obese. From WHO data, we conclude that 18.8% are overweight and 12.8% obese.

Facts:

Boys living in urban areas are more overweight and obese than those living in rural areas.

The lowest obesity was calculated using IOTF data, which coincides with boys living in rural areas at 4.4%.

Table 16 Prevalence of overweight and obesity in Balkan among boys, by location

		Albanian reference population BASIC		International Obesity Task Force		WHO	
	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Balkan	9266	10.86	5.92	16.48	6.15	18.76	12.76
Urban	7753	11.54	6.17	17.23	6.49	19.40	13.45
Rural	1513	7.34	4.69	12.62	4.43	15.47	9.19

Estimates based on Albanian reference population- BASIC, IOTF and WHO

The prevalence of overweight and obesity in Albanian boys living in the Balkans, divided by the respective countries, is presented in Table 19. For the calculation of overweight and obesity, 3 BMI percentiles by age (Albanian reference population- BASIC, IOTF, WHO) were used. Using the WHO BMI percentiles by age of Albanian children's measurements in the calculation, we conclude that 22.8% of Montenegrin boys are overweight and 22.2% of them are obese, and in Albania 19.8% are overweight and 13.1% are obese.

Facts:

According to the IOTF calculations, 24.5% of Montenegrin boys are overweight.

Albanian boys have the second highest prevalence in the Balkans.

Kosovars are less overweight and less obese.

Table 17 Prevalence of overweight and obesity in Balkan among boys, by countries

		Albanian reference population\ BASIC		International Obesity Task Force		WHne O	
Individual countries	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	4867	11.53	5.77	17.38	6.10	19.77	13.11
Kosovo	2064	7.32	3.34	11.58	3.59	14.92	7.75
FYR Macedonia	1442	9.92	7.07	15.46	7.14	18.31	12.90
Montenegro	893	16.91	10.86	24.52	10.75	22.84	22.17

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Table 20 presents the prevalence of overweight and obesity among Albanian boys in the Balkans, divided by country and the respective areas where they live. The 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used to calculate overweight and obesity. According to IOTF data, Kosovo boys living in rural areas have a prevalence of 0.8% obesity and 5.1% overweight. According to the same data, Montenegro boys have a prevalence of 25.3% obesity and 14.1% obesity.

Facts:

Boys living in rural areas in Macedonia are more overweight and obese than those living in urban areas.

BASIC and IOTF data on the prevalence of Kosovo boys living in rural areas are equal (0.8%).

According to WHO data, 20.7% of Albanian boys living in urban areas are overweight.

Table 18 Prevalence of overweight and obesity in Balkan among boys, by countries and location

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries	(Urban/Rural)	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	Urban	4094	12.60	6.35	18.64	6.79	20.66	14.51
	Rural	773	5.82	2.72	10.74	2.46	15.01	5.69
Kosovo	Urban	1693	8.27	3.90	12.99	4.19	16.07	8.86
	Rural	371	2.96	0.81	5.12	0.81	9.70	2.70
FYR Macedonia	Urban	1322	9.83	6.96	14.90	7.03	18.23	12.48
	Rural	120	10.83	8.33	21.67	8.33	19.17	17.50
Montenegro	Urban	644	16.93	9.32	24.22	9.47	22.52	20.81
	Rural	249	16.87	14.86	25.30	14.06	23.69	25.70

Estimates based on Albanian reference population- BASIC, IOTF and WHO

The prevalence of overweight and obesity in Albanian boys living in the Balkans depending on the school they attend is presented in Table 21. For the calculation of overweight and obesity, 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used. From the data used in the BASIC and WHO calculations, Albanian boys attending primary school are overweight and more obese than those attending lower secondary school, while using the IOTF percentiles in the calculation, it appears that boys attending primary school (17%) are less overweight than those attending lower secondary school (17.3%).

Facts:

Boys attending primary school in Macedonia are less overweight and more obese than those attending lower secondary school.

From the IOTF data 4. % of Kosovar boys attending primary school are obese.

According to IOTF data, boys who attend primary school are less overweight and more obese than those who attend lower secondary school.

Table 19 Prevalence of overweight and obesity in Balkan among boys, by countries and school level

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries (school-level)		n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	elementary school	2550	12.08	6.35	16.98	7.53	19.92	15.92
	secondary school	1991	10.65	4.82	17.28	4.12	19.29	8.94
Kosovo	elementary school	1262	7.29	3.33	10.54	4.04	13.63	9.19
	secondary school	802	7.36	3.37	13.22	2.87	16.96	5.49
FYR Macedonia	elementary school	859	8.15	7.57	13.27	8.27	15.60	14.20
	secondary school	583	12.52	6.35	18.70	5.49	22.30	10.98
Montenegro	elementary school	475	17.05	10.32	24.00	11.37	22.53	24.84
	secondary school	418	16.75	11.48	25.12	10.05	23.21	19.14

Prevalence of overweight and obesity in Albanian children (girls) living in the Balkans

The prevalence of overweight and obesity in Albanian children (girls) living in the Balkans, divided by area of residence, is presented in Table 22. The total number of measurements is 9194, of which 7763 live in urban areas of the Balkans and 1431 in rural areas. The prevalence of overweight in Albanian girls living in the Balkans is 9.7% and that of obesity is 5.5%.

Facts:

Albanian girls living in urban areas are more overweight and obese than those living in rural areas.

10.4% of Albanian girls in the Balkans living in urban areas are overweight and 5.9% of them are obese.

6.2% of girls living in rural areas are overweight and 3.8% are obese.

Table 20 Prevalence of overweight and obesity in Balkan among girls, by location

	n	Overweight (%)	Obese (%)
Balkan	9194	9.73	5.54
Urban	7763	10.4	5.85
Rural	1431	6.15	3.84

Estimates based on Albanian reference population- BASIC

Table 23 shows the prevalence of overweight and obesity among Albanian girls living in the Balkans, divided by country. The largest number of measurements was made in Albania (N=4868). Macedonian girls have a prevalence of 11.6% overweight and 6.6% obesity.

Facts:

Kosovo girls have a prevalence of 6.3% overweight and 3.3% obesity.

10.2% of Albanian girls are overweight and 5.6% are obese.

Montenegrin girls are the most overweight (12.6%) and the most obese (9.5%) in the Balkans.

Table 21 Prevalence of overweight and obesity in Balkan among girls, by countries

Individual countries	n	Overweight (%)	Obese (%)
Albania	4868	10.21	5.55
Kosovo	2099	6.29	3.33
FYR Macedonia	1444	11.57	6.58
Montenegro	783	12.64	9.45

Estimates based on Albanian reference population- BASIC

The prevalence of overweight and obesity in Albanian girls living in the Balkans by area of residence is presented in Table 24. Albanian girls living in urban areas have a higher prevalence of overweight and obesity than those living in rural areas. Kosovar girls living in urban areas are 6.8% overweight and 3.8% obese. Montenegrin girls are more overweight and obese than other Balkan girls.

Facts:

Girls living in rural areas in Macedonia (7.8%) are more obese than those living in urban areas (6.5%).

Montenegrin girls living in urban areas (8.1%) are less obese than those living in rural areas (12.6%).

Table 22 Prevalence of overweight and obesity in Balkan among girls, by countries and location

Individual countries (Urban/Rural)		n	Overweight (%)	Obese (%)
Albania	Urban	4134	11.03	6.22
	Rural	734	5.59	1.77
Kosovo	Urban	1744	6.77	3.78
	Rural	355	3.94	1.13
FYR Macedonia	Urban	1341	12.08	6.49
	Rural	103	4.85	7.77
Montenegro	Urban	544	13.05	8.09
	Rural	239	11.72	12.55

Estimates based on Albanian reference population- BASIC

The prevalence of overweight and obesity among Albanian girls living in the Balkans by school is presented in Table 25. Montenegrin girls attending primary school have the highest prevalence of overweight (15.4%) in the Balkans, while among those attending lower secondary school, Macedonian girls have the highest prevalence with 12.4%.

Facts:

Albanian, Kosovar and Montenegrin girls attending primary school are more overweight and obese than those attending lower secondary school.

Macedonian girls attending primary school are less overweight and less obese than those attending lower secondary school.

The highest prevalence of obesity in the Balkans is among Montenegrin girls attending primary school (9.7%).

Table 23 Prevalence of overweight and obesity in Balkan among girls, by countries and school level

Individual countries (school-level)		n	Overweight (%)	Obese (%)
Albania	elementary school	2524	11.13	5.90
	secondary school	1992	8.84	5.07
Kosovo	elementary school	1285	5.84	7.00
	secondary school	814	3.42	3.19
FYR Macedonia	elementary school	839	10.97	6.08
	secondary school	605	12.40	7.27
Montenegro	elementary school	411	15.33	9.73
	secondary school	372	9.68	9.14

Estimates based on Albanian reference population- BASIC

The prevalence of overweight and obesity using child body mass index (BMI) data of Albanian girls living in the Balkans divided by the areas where they live is presented in Table 26. BMI percentiles (BASIC, IOTF, WHO) were used to calculate the prevalence of overweight and obesity. Using the BMI percentiles by age (IOTF and WHO) of Albanian girls in the calculation, we conclude that 14.7% are overweight (IOTF) and 4.2% obese (IOTF) while 17.7% are overweight (WHO) and 7% obese (WHO).

Facts:

In the Balkans, 15.5% (IOTF) and 18.4% (WHO) of Albanian girls living in urban areas are overweight.

From the calculations of each study, it appears that girls living in urban areas are more overweight and obese than those living in rural areas.

In the Balkans, 2.8% (IOTF) and 4.82% (WHO) of Albanian girls living in rural areas are obese.

Table 24 Prevalence of overweight and obesity in Balkan among girls, by location

		Albanian reference population BASIC		International Obesity Task Force		WHO	
	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Balkan	9194	9.73	5.54	14.67	4.24	17.71	6.98
Urban	7763	10.4	5.85	15.51	4.51	18.42	7.38
Rural	1431	6.15	3.84	10.13	2.80	13.84	4.82

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Table 27 presents the prevalence of overweight and obesity among Albanian girls in the Balkans, divided by the countries where they live. The 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used to calculate overweight and obesity. According to WHO data, Montenegrin girls are the most overweight in the Balkans with a prevalence of 21.3% and the most obese with a prevalence of 12.7%. According to the same data, Kosovo girls have the lowest prevalence of overweight (13.4%) and obesity (3.8%) in the Balkans.

Facts:

The prevalences calculated from WHO data are the highest for both overweight and obesity.

According to IOTF data, 15.3% of Albanian girls are overweight and 4.2% are obese.

Albanian girls in the Balkans have a higher prevalence of overweight than obesity.

Table 25 Prevalence of overweight and obesity in Balkan among girls, by countries

		Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	4868	10.21	5.55	15.32	4.21	18.55	7.17
Kosovo	2099	6.29	3.33	9.81	2.57	13.39	3.81
FYR Macedonia	1444	11.57	6.58	17.17	4.92	19.18	7.89
Montenegro	783	12.64	9.45	19.03	7.66	21.33	12.64

Estimates based on Albanian reference population- BASIC, IOTF and WHO

The prevalence of overweight and obesity among Albanian girls in the Balkans, divided by country and the respective areas where they live, is presented in Table 28. For the calculation of overweight and obesity, the 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used. From the IOTF data, it appears that 19.5% of Albanian girls living in urban areas are overweight and 8% are obese. and have a prevalence of 0.8% of obesity and 5.1% of overweight. From the same data, Montenegrin girls have a prevalence of 25.3% of overweight and 14.1% of obesity, being the second among Albanian girls in the Balkans immediately after Montenegrin girls, which from the same data have a prevalence of 21.5% of overweight and 11.4% of obesity.

Facts

Data calculated from IOTF and WHO BMI percentiles are consistent.

Macedonian girls living in rural areas are more overweight than those living in urban areas (IOTF & WHO).

Montenegrin girls living in rural areas are more obese than those living in urban areas (IOTF & WHO)

Table 26 Prevalence of overweight and obesity in Balkan among girls, by countries and location

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries	(Urban/Rural)	n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	Urban	4134	11.03	6.22	19.55	7.98	19.55	7.98
	Rural	734	5.59	1.77	12.94	2.59	12.94	2.59
Kosovo	Urban	1744	6.77	3.78	14.22	4.30	14.22	4.30
	Rural	355	3.94	1.13	9.30	1.41	9.30	1.41
FYR Macedonia	Urban	1341	12.08	6.49	19.16	7.90	19.16	7.90
	Rural	103	4.85	7.77	19.42	7.77	19.42	7.77
Montenegro	Urban	544	13.05	8.09	21.51	11.40	21.51	11.40
	Rural	239	11.72	12.55	20.92	15.48	20.92	15.48

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Table 29 presents the prevalence of overweight and obesity among Albanian girls living in the Balkans, depending on the school they attend. The 3 percentiles of BMI by age (Albanian reference population- BASIC, IOTF, WHO) were used to calculate overweight and obesity. Girls in Montenegro and Albania who attend primary school are more overweight and obese than those who attend lower secondary school.

Facts:

Kosovar and Macedonian girls who attend primary school are more overweight and obese than those who attend lower secondary school (BASIC).

Girls in Kosovo and Macedonia who attend primary school are less overweight than those who attend lower secondary school, but more obese (IOTF & WHO).

Macedonian girls who attend lower secondary school are the most overweight in the Balkans.

Table 27 Prevalence of overweight and obesity in Balkan among girls, by countries and school level

			Albanian reference population BASIC		International Obesity Task Force		WHO	
Individual countries (school-level)		n	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)	Overweight (%)	Obese (%)
Albania	elementary school	2524	11.13	5.90	15.61	5.11	18.66	8.56
	secondary school	1992	8.84	5.07	14.76	3.01	17.97	5.17
Kosovo	elementary school	1285	5.84	7.00	8.48	3.11	11.91	4.36
	secondary school	814	3.42	3.19	11.92	1.72	15.72	2.95
FYR Macedonia	elementary school	839	10.97	6.08	15.02	5.60	17.52	8.22
	secondary school	605	12.40	7.27	20.17	3.97	21.49	7.44
Montenegro	elementary school	411	15.33	9.73	20.92	8.76	21.41	15.33
	secondary school	372	9.68	9.14	16.94	6.45	21.24	9.68

Estimates based on Albanian reference population- BASIC, IOTF and WHO

Conclusions

The project data show (using the BASIC BMI-for-age percentiles) that the prevalence of overweight children in the Balkans is 10.3% (10.9% boys and 9.7% girls) and obese children 5.7% (5.9% boys and 5.5% girls). The data show that boys have a higher percentage of both overweight and obesity than girls, and the lowest prevalence of overweight and obesity is 6.2% and 3.8% among girls living in rural areas in the Balkans (using the BASIC BMI-for-age percentiles in the calculation of BMI).

At the national level, Montenegro has the highest prevalence of overweight with 14.9% and obesity with 10.2%. Kosovar boys have the lowest prevalence of overweight with 7.3% and obesity with 3.3% compared to boys living in other countries. The same picture is for girls where they have the lowest prevalence of overweight with 6.3% and obesity with 3.3% compared to girls living in other countries. The most overweight children (16.9%) in the Balkans are Montenegrin boys living in urban areas and the most obese (14.9%) are boys living in rural areas of Montenegro. The lowest prevalence of overweight is found in boys (3.4%) and girls (0.8) in Kosovo living in rural areas. Unlike other children in the Balkans, Macedonian boys living in rural areas have a higher prevalence of obesity than those living in urban areas.

From the project data compared with the three references (BASIC, IOTF and WHO) it is seen that with the same database of Albanian children's BMI, different conclusions are presented regarding the prevalence of overweight and obesity.

In the Balkans, 5.7% of children are obese and 10.3% are overweight (the BMI percentiles according to age of Albanian children "BASIC" were used in the calculation). Using the BMI percentiles according to age of non-Albanian children (IOTF and WHO) in the calculation, we conclude that: 5.2% are obese (IOTF) and 15.6% are overweight (IOTF) while 9.9% are obese (WHO) and 18.2% are overweight (WHO).

In conclusion, we can say that policy-makers now have a necessary database to draft policies to promote an active lifestyle in children as well as optimal conditions to promote physical activity,

References

Cole, T. J. (1990). "The LMS method for constructing normalized growth standards." European Journal of Clinical Nutrition **44** (1): 45-60.

Van Buuren, S. and M. Fredriks (2001). "Worm plot: A simple diagnostic device for modelling growth reference curves." Statistics in Medicine **20** (8): 1259-1277.

Wang, Y., L. A. Moreno, B. Caballero and T. J. Cole (2006). "Limitations of the current world health organization growth references for children and adolescents." Food Nutr Bull**27**(4 Suppl Growth Standard): S175-188.

Albania

INSTAT (2012). Pupils enrolled by stages on basic education. Statistical database

INSTAT(2009). Indicators by prefectures 2007 -2008

Ministry of Education and Science (2008) Republic of Albania. National strategy 2008 - 2013

The Census 2011 in Albania. It was conducted in 2011 as in the most of the European countries following UNECE/Eurostat recommendations, in the framework of the 2010 World Population and Housing Census Programme of the United Nations.

Kosovo

Statistical Records (2011-2012). Republic of Kosovo.Ministry of Education, Science and Technology. Data on education

FYR Macedonia

Reports about elementary and Secondary School. State statistical office of Republic of Macedonia Skopje 1999-2003

Republic of Macedonia, Ministry of Education and Science, Bureau for Development of Education, National Report for Development of Education in the Republic of Macedonia 2001- 2004 Skopje pg 16-17

Primary, lower secondary and upper secondary schools at the end of the school year 2012/2013 - preliminary data. State Statistical Office No: 2.1.14.08

url publikum@stat.gov.mk; www.stat.gov.mk

Montenegro

Education in Montenegro needs assessment. Report Prepared by: Heather Iliff, Institute for Educational Policy Open Society Institute . Budapest

This needs assessment was prepared by Open Society Institute, in cooperation with theMinistry of Education and Science in Montenegro (MES). Significant contributions havebeen made by UNICEF and WUS Austria, and comments and suggestions on the document have been provided by several other donors.

Contributors to the realization of the project:

Abeliana Bregu, Albian Blloku, Aljona Kristuli, Andi Kullolli, Andi Lalaj, Arber Asllani, Aurel Gjana, Bora Sulka, Bush Tota, Daniel Tomorri, Dea Rusi, Ditmar Jubica, Dorjan Isufaj, Erald Malushi, Erind Tosku, Eris Hysenaj, Erlin Samimi, Ermal Duraj, Eridiola Buzi, Ervin Zorba, Ervis Gjoni, Fifler Doka, Filip Mucaj, Flavio Ibrahimi, Gentian Tota, Gentiana Nicaj, Genti Husha, Geraldina Pambuku, Gerti Murataj, Grios Pirra, Irezuela Gjini, Izmir Dibra, Jerina Hoxha, Jorges Xhoxhi, Julian Mema, Jurgen Sejdini, Kelvin Pepa, Klaudio Sejati, Klejda Lala, Klen Fagu, Laert Troja, Eridiola Buzi, Leonard Sota, Lisander Dumani, Lul Copa, Marina Tasho, Marjo Shabanaj, Mirjet Vllacaj, Morena Hyselenka, Oltion Lalaj, Orsiola Isufi, Paola Tasho, Remi Cenolli.

Data analysic and results- Anisa Nurja

Rectorate of the University of Sports of Tirana

Staff of the University of Sports of Tirana

MASR and Regional Directorates

Principals and teachers of the schools that participated in this study

News about the project

To carry out the project, a total of about 8498 km was traveled in the four countries to carry out the measurements in 47 days and 390 hours of measurements in schools.

To assess the level of physical activity, 18500 questionnaires were used, including 74,000 sheets (A4). To enter the questionnaires into the electronic database, 55,500 minutes were spent, calculated at 925 hours.