



# WHO Childhood Obesity Surveillance Initiative (COSI)



Tervise Arengu Instituut  
National Institute for Health Development



National Institute for Health Development

# **WHO Childhood Obesity Surveillance Initiative (COSI)**

**Estonian study report for the academic year 2015/2016**

Anneken Metsoja, Liis Nelis, Eha Nurk

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# FOREWORD

Like many other countries, Estonia faces the challenge of childhood obesity as one of the major issues of public health care. Children who are overweight and obese are more likely to carry excess weight into adulthood, and suffer from non-communicable diseases such as diabetes or cardiovascular diseases in adolescence. Fortunately, excess weight and obesity, and the diseases they may cause are easily preventable. Thus, it is important to manage and prevent health issues in early childhood rather than deal with the treatment of illnesses later in life.

Detailed and reliable data is needed to improve the current situation, and the European Childhood Obesity Surveillance Initiative (COSI) has collected such data since 2007. Estonia joined the initiative in 2015, and as a result of the 2015/2016 study, we now have a set of reliable data that is applicable to international comparison.

Unfortunately, the results are nothing to celebrate: every fourth first-grade pupil is either overweight or obese, the latter being more common among boys. The data confirms that excess weight is related to a lack of exercise and an unbalanced diet.

More than half of the schools have more physical education lessons in their curriculum than mandatory, and most schools provide their pupils with free extracurricular sports. However, the results vary in different regions and children living in rural areas are less physically active than those living in urban areas. Due to various EU programmes, many children have the opportunity to get free fruit and vegetables, as well as unsweetened dairy products at school. Yet, in more than half of the schools, children can buy sweets, and two out of three schools provide their pupils with sugary soft drinks and juice drinks.

Excess body weight can be managed by engaging the children in more extracurricular physical activities and sports clubs. It is also important to ensure that the child starts their day with a healthy and balanced breakfast. The ultimate goal is to promote the physical activity- and diet-related habits that help maintain an energy balance throughout life, creating a stable base for good health and wellbeing.

Annika Veimer

Director of the National Institute for Health Development

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The input of all persons involved in the study should be recognised. Firstly, we would like to thank all participating **first-grade pupils of the academic year 2015/2016** who were willing to be measured and questioned in the doctor's office or classroom. We would also like to express our sincere gratitude to the **parents of these children** who realised the importance of this study and allowed their children to participate. We are very thankful for the **boards and employees of all participating schools** who were extremely understanding of yet another study being conducted in their school (there are plenty of studies taking place in springtime), finding a way to make the study happen during the last months of the academic year and offering their help whenever necessary. Special thanks are due to **Kädi Lepp** and **Valentina Hazinskaja** from the **SA Tallinna Koolitervishoid** (Tallinn Health Care at School Foundation), and **Kristin Mäger** and **Riina Unt** from the **Tartu Koolitervishoiu OÜ** (Tartu School Health Care) who managed to find the time and energy to expand their activity from the schools of a single city to half of the schools in Estonia. They were responsible for managing the measuring and questioning of children across Estonia. In addition to local school employees, they had help from the following people in Harju, Hiiu, Ida-Viru, Järva, Lääne, Lääne-Viru, Pärnu, Rapla and Saare counties:

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On behalf of the study team  
Eha Nurk  
Principal investigator of COSI

# INTRODUCTION

Much like the global trend (Ezzati 2017), the percentage of overweight and obesity in Estonia has been on the consistent year-on-year increase. The proportion of people with excess body weight in the adult population grew from 43% in 2004 to 52% in 2014 (Tekkel, Veidemann 2015). During that time, the percentage of overweight and obese children nearly doubled: according to the Estonian Health Insurance Fund, the percentage of pupils with excess body weight increased from 6.5% in the academic year of 2004/2005 to 11% in the academic year of 2013/2014 (Estonian Health Insurance Fund 2014). As reported by the WHO, one in three children in the EU aged 6–9 years is overweight or obese (EC 2014), which increases their risk of overweight and obesity as well as certain non-communicable diseases (cardiovascular diseases and type II diabetes) in adulthood (Kavey 2010).

The current population-based data available on the overweight of children aged 6–9 years in Estonia is inaccurate and does not allow for a detailed analysis. The measuring and weighing reports compiled by Eesti Haigekassa (Estonian Health Insurance Fund s.a.) do not enable the analysis of excess body weight by age and sex. Therefore, the aim of the forthcoming Green Paper on nutrition and physical activity is to further develop indicators of national significance, such as using new data sources to improve the quality of data and conduct further studies if needed. One of these measures is the implementation of the European Childhood Obesity Surveillance Initiative (COSI) among first-grade pupils in Estonia during the academic year 2015/2016, and expanding the initiative in a way that enables a combination of the routine health checks of school health providers with the study measurements during the following studies.

COSI is an initiative brought to life by the WHO Regional Office for Europe (WHO 2018) aimed at combating the emerging obesity epidemic. The initiative helps to assess the overweight and obesity trends among children aged 6–9 years, give an accurate overview of the epidemic and develop necessary interventions. In addition to overweight and obesity, the dietary habits and physical activity trends are assessed in Europe as a whole, and compared in participating countries. The first waves of data collection took place in 2007/2008, 2009/2010 and 2012/2013. Estonia joined the initiative in the fourth wave, during the academic year of 2015/2016. COSI is currently established in 35 EU countries.

COSI was developed by WHO experts in cooperation with the participating countries. The data is analysed on the national as well as European level. WHO is responsible for the development of the study protocol (WHO 2016a), a uniform data collection procedure (WHO 2016b) and data analysis on a European level. The prevalence data collected in the study is also published in the WHO European Database on Nutrition, Obesity and Physical Activity (WHO 2014). Each participating country undertakes to arrange a standardised data collection based on the procedure provided by WHO (WHO 2016b), as well as analyse and publish the results on a national level.

This report gives an overview of the methodology and results of the first COSI study conducted in Estonia. The results chapter examines the background data gathered on the children (place of residence, nutrition and physical activity within the school environment, routes to and from school) and provides an overview of the anthropometric measurements and associations with health behaviour of children (physical activity, eating breakfast).

Additional standardised tables of the study results by various identifiers will be published in the NIHD's Health Statistics and Health Research Database ([http://pxweb.tai.ee/PXWeb2015/index\\_en.html](http://pxweb.tai.ee/PXWeb2015/index_en.html)) under the category Health and Health Behaviour.

# I METHODOLOGY

## 1. Sampling

Each participating country can decide on the exact sampling method and size of the sample as long as it remains representative of the country and has at least 2,800 children in each chosen age group. The Estonian sample was compiled of all first-grade pupils (N=15,457) from 497 general education schools.

Schools whose board refused to participate or with whom a suitable time for data collection could not be agreed upon were excluded from the sample. The study also omitted schools with a very small number of pupils, distant schools, English-speaking schools and a few special needs education schools. An overview of non-participating schools by county is given in Table 1.1. The sample did not include pupils who were absent on the day of the study (N=666), pupils whose parents did not give consent for them to be examined (N=457), and pupils who did not want to participate (N=23).

**Table 1.1.** Schools' reasons for non-participation by county

County	Total number of schools	Reason for not participating										Total	
		The school refused	The parents refused	The suggested time was not suitable	A small distant school (less than 10 pupils)	A distant school, no available examiners	Special needs education school	English-speaking school	Unable to contact the school	No pupils in first grade	N	%	
		<b>N</b>										<b>N</b>	<b>%</b>
Harju	142	9	3		1		1	2				16	11
Hiiu	6											0	0
Ida-Viru	39	3			8							11	28
Jõgeva	22	5		2					2			9	41
Järva	21				5		1					6	29
Lääne	20				1							1	5
Lääne-Viru	33	5			5							10	30
Põlva	19	3		2					3			8	42
Pärnu	38	1			10	7						18	47
Rapla	22											0	0
Saare	19				4							4	21
Tartu	51	11		5								16	31
Valga	18	2										2	11
Viljandi	26	1					1					2	8
Võru	21	8		3					1	1		13	62
<b>Total</b>	<b>497</b>	<b>48</b>	<b>3</b>	<b>12</b>	<b>34</b>	<b>7</b>	<b>3</b>	<b>2</b>	<b>6</b>	<b>1</b>		<b>116</b>	<b>23</b>

Data was collected on a total of 12,900 pupils from 381 schools. Pupils who were 6, 9 or 10 years old at the time of the study (N=175) or who were missing a value needed for calculating the body mass index (BMI) (N=25) were excluded from the analysis. After the data cleaning, 12,700 pupils were left in the analysis, 51% of whom were boys, and the proportion of 7- and 8-year-olds was almost equal (Table 1.2). The final participation rate was 82% among pupils and 77% among schools.

**Table 1.2.** Participants by age and sex

Age (yrs)	Boys	Girls	Total
7	3,006	3,285	<b>6,291</b>
8	3,496	2,913	<b>6,409</b>
<b>Total</b>	<b>6,502</b>	<b>6,198</b>	<b>12,700</b>

## 2. Ethical aspect

The COSI protocol is implemented in accordance with the International Ethical Guidelines for Biomedical Research Involving Human Subjects (CIOMS 2002). The Estonian study protocol was approved by the Tallinn Medical Research Ethics Committee (TMEK meeting protocol No. 24, decision No. 1376, 28 March 2016). Consent was acquired on three levels: the school, the parents and the child. Each school received a notification letter giving an overview of the study, after which the school had the opportunity to notify the NIHD or the local examiner of their refusal. The parents were sent an introductory e-mail at least a week before the measurements took place and a passive consent approach was applied. Consent was asked from each child before taking any measurements—if the child refused, the examiner did not proceed with the measurements.

## 3. Data collection

Questioning and measuring was carried out by health care specialists or other workers employed in the field of health who had completed the appropriate training and studied the document on COSI data collection procedures (Appendix 1). In Harju, Hiiu, Saare, Pärnu, Lääne, Rapla, Järva, Lääne-Viru and Ida-Viru counties data collection was organised by the SA Tallinna Koolitervishoid (Tallinn Health Care at School Foundation), and in Tartu, Viljandi, Jõgeva, Põlva, Võru and Valga counties by the Tartu Koolitervishoiu OÜ (Tartu School Health Care). Pupils were questioned and measured in the classroom or the school nurse's office. If possible, two examiners took two consecutive measurements from each child to reduce the risk of human error. In case of two different measurement results, the average of the two was reported as the final result. If possible, measurements were taken before lunch time (N=8,567, 67%).

### 3.1 Anthropometric measurements

Anthropometric measurements included height, weight, and waist and hip circumferences. Children were instructed to wear light clothing or underwear at the time of measuring. They were asked to remove their shoes and any heavy or bulky items, such as mobile phones, keys, watches, belts and hair accessories. For weighing, the examiners used the SECA 878 digital medical scales that had been calibrated. The schools in Tallinn also used the SECA 711, Tanita BWB-800-P and Tanita BF-350 scales. For height measurements, Tanita Leicester HR 001 portable vertical height boards with a reinforced plastic stand were used. Waist and hip circumferences were measured with the SECA 201 non-elastic measuring tape. Waist and hip circumference and height were measured to the nearest 0.1 cm and weight to the nearest 0.1 kg.

## 3.2 Nutrition and physical activity

In addition to taking different measurements, the pupils were asked about their physical activity and dietary habits (Appendix 2): the means of getting to and from school (walking, cycling, car or public transportation), being a member of sports clubs or extracurricular physical activities, eating breakfast on the day of data collection (not including water, milk and juice).

## 3.3 School environment

All participating schools were asked to fill out a form about the school environment (Appendix 3). The form was filled out by the school principal or head teacher (62%), teacher (19%) or another school employee (17%), such as a health care worker (school doctor or nurse), financial manager, managing clerk, secretary, head of studies, recreation manager, psychologist, special education specialist or social educator. On one occasion, the head of the canteen contributed to the form, and on seven forms (2%) there was no indication of who had filled it out. The aim of the form was to learn if there was an outdoor playground or indoor gym available at the school, how many minutes of physical education lessons the school provided to the pupils of each first grade in a week, and whether the school organised any sports activities outside school hours. The school representative was also asked to assess the safety of the pupils' route to and from school, choose from a list the foods and beverages available at their school, and answer questions about health promoting activities and projects organised in the school.

## 4. Data analysis

Before the fieldwork started, each participating school and pupil was assigned a unique code, thereby ensuring the anonymity of all collected data.

Multiple-choice answers were coded and data from all paper forms was entered into an electronic data file. Next, the data was cleaned, removing any subjects who were not of suitable age or were missing one of the essential data points (height, weight, waist and hip circumference). To calculate a child's age, the following formula was used:  $(\text{date of measurement} - \text{date of birth})/365.25$ . Descriptive statistical analyses and  $\chi^2$ -tests were performed using MS Excel and SPSS. A p-value of less than 0.05 was considered significant.

The interpretation of anthropometric measurements and calculation of the age-specific BMI ( $\text{kg m}^{-2}$ ) was based on the WHO growth references indicated by age and sex (WHO 2007), according to which the BMI cut-offs should be interpreted as follows: underweight is less than  $-2$  SD, normal weight is between  $-2$  SD and  $+1$  SD, overweight is more than  $+1$  SD and less than  $+2$  SD, and obesity is more than  $+2$  SD. Because of their small percentage (1.6%), underweight pupils were included with normal weight pupils.

## II BACKGROUND

### 1. Place of residence

Most of the participating pupils (2/3) lived in towns, almost a fifth in villages, and the rest in boroughs (Table 2.1). Nearly three quarters of the subjects were from North or South Estonia—52% and 21%, respectively. More than half of the pupils lived in Harju County, approximately a tenth in both Tartu and Ida-Viru counties. The smallest number of pupils (0.6%) lived in Hiiu County.

**Table 2.1.** Participants by place of residence (N=12,700)

		Boys		Girls		Total	
		N	%	N	%	N	%
<b>Type of settlement</b>	Town	4,316	67	4,139	67	<b>8,455</b>	<b>67</b>
	Borough	940	14	904	15	<b>1,844</b>	<b>15</b>
	Village	1,234	19	1,149	19	<b>2,383</b>	<b>19</b>
<b>Region<sup>1</sup></b>	North Estonia	3,357	52	3,261	53	<b>6,618</b>	<b>52</b>
	West Estonia	614	9	590	10	<b>1,204</b>	<b>9</b>
	Central Estonia	572	9	517	8	<b>1,089</b>	<b>9</b>
	North-East Estonia	578	9	512	8	<b>1,090</b>	<b>9</b>
	South Estonia	1,381	21	1,318	21	<b>2,699</b>	<b>21</b>
	<b>County</b>	Harju	3,357	52	3,261	53	<b>6,618</b>
	Hiiu	41	1	32	1	<b>73</b>	<b>1</b>
	Ida-Viru	578	9	512	8	<b>1,090</b>	<b>9</b>
	Jõgeva	109	2	114	2	<b>223</b>	<b>2</b>
	Järva	145	2	141	2	<b>286</b>	<b>2</b>
	Lääne	113	2	111	2	<b>224</b>	<b>2</b>
	Lääne-Viru	230	4	205	3	<b>435</b>	<b>3</b>
	Põlva	105	2	94	2	<b>199</b>	<b>2</b>
	Pärnu	322	5	312	5	<b>634</b>	<b>5</b>
	Rapla	197	3	171	3	<b>368</b>	<b>3</b>
	Saare	138	2	135	2	<b>273</b>	<b>2</b>
	Tartu	683	11	668	11	<b>1,351</b>	<b>11</b>
	Valga	129	2	122	2	<b>251</b>	<b>2</b>
	Viljandi	228	4	205	3	<b>433</b>	<b>3</b>
	Võru	127	2	115	2	<b>242</b>	<b>2</b>

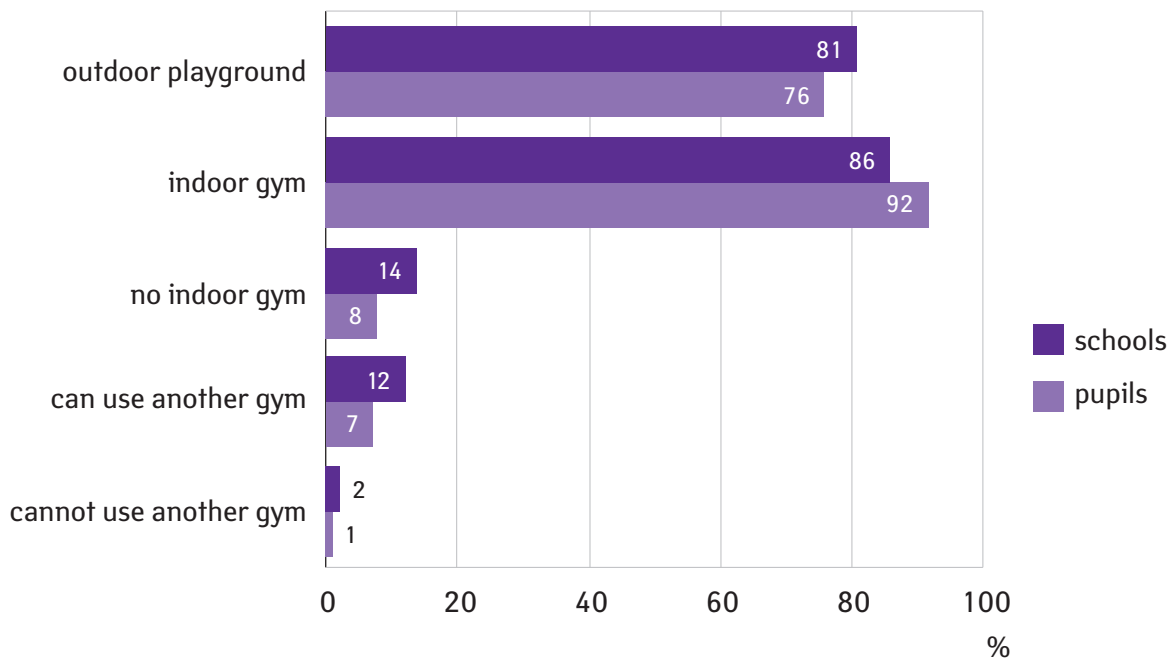
<sup>1</sup> Region defined according to the NUTS 3 (*Nomenclature des unités territoriales statistiques*) classification:

- North Estonia – Harju County
- West Estonia – Hiiu, Lääne, Pärnu and Saare counties
- Central Estonia – Järva, Lääne-Viru and Rapla counties
- North-East Estonia – Ida-Viru County
- South Estonia – Jõgeva, Põlva, Tartu, Valga, Viljandi and Võru counties

## 2. Playgrounds and gyms

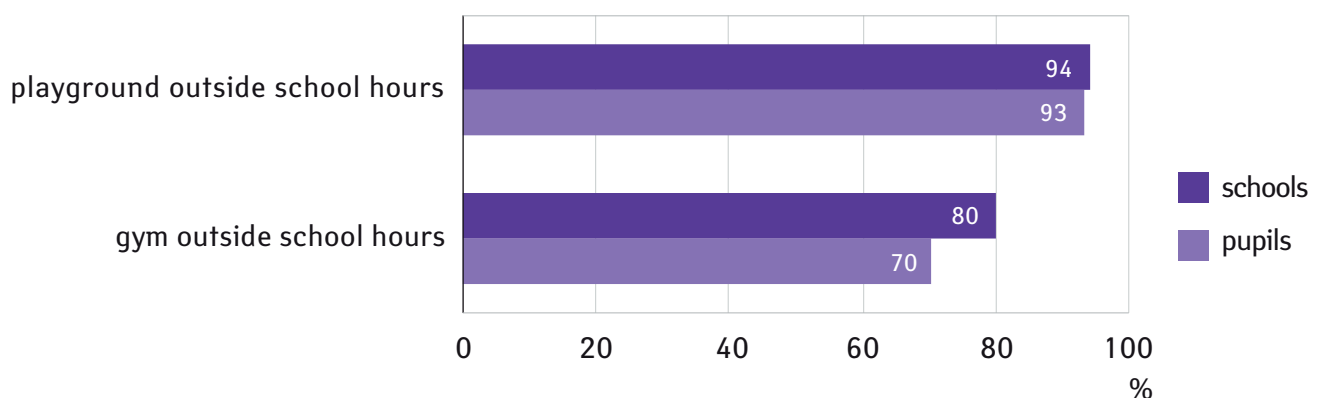
The school record form included questions about the availability of an outdoor playground and indoor gym. If there was no gym on the school premises, the representative was asked whether the pupils could use another nearby gym. The examiner also asked whether the pupils were allowed to use the playground and gym outside school hours.

Approximately a fifth of all schools did not have a playground on school premises—equalling to approximately a fourth of all first-grade pupils (Figure 2.1). The percentage of schools and pupils who had a gym was higher—86% of schools and 92% of pupils had a gym on school premises and 12% of schools and 7% of pupils were able to use a nearby gym for their physical education lessons. Therefore, only 0.9% of all pupils did not have the opportunity to use a gym.



**Figure 2.1.** The availability of gyms and playgrounds by schools (N=381) and pupils (N=12,700), %

In most of the schools that had a playground, the pupils were also allowed to use it outside school hours, totalling to 93% of all pupils (Figure 2.2). The schools that had a gym, however, had a more limited after-hours access to the premises: 4/5 of such schools and 70% of pupils had the opportunity to use the gym outside school hours.



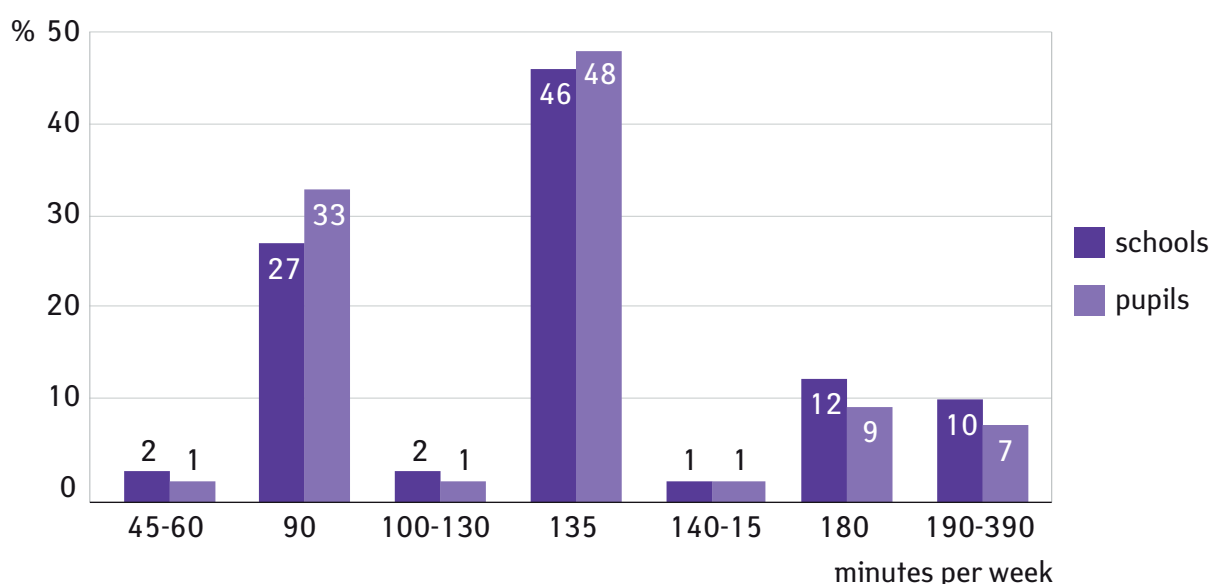
**Figure 2.2.** The possibility of using an outdoor playground or indoor gym outside school hours in schools that have an outdoor playground (N=310) or indoor gym (N=329), by schools and pupils (N=9,657 have a playground and N=11,719 have a gym), %

### 3. Additional physical education lessons

One of the aims of the study was to determine if the schools' curricula contained any additional physical education lessons (in addition to the mandatory ones) and whether these lessons were organised for specific grades or all pupils. Additional physical education lessons were provided for all pupils in 19% of the schools, 40% of schools only organised these lessons for specific grades and 39% of schools did not have such lessons in their curriculum.

For each participating class, the school representative was asked to give the total duration of all physical education lessons given in one week during the academic year of 2015/2016. The duration of physical education lessons varied significantly between schools, ranging from 45 minutes per week to 390 minutes per week (Figure 2.3). The average weekly duration of physical education lessons was 137 minutes for schools (SD 47) and 132 minutes for pupils (SD 42), equalling to about three 45-minute lessons per week. The median duration for both schools and pupils came to 135 minutes per week.

A third of the pupils had 90 minutes of physical education in their weekly timetable, half of the pupils were provided with 180 minutes, and 7% of the pupils with more than 180 minutes (between 190 and 390 minutes).

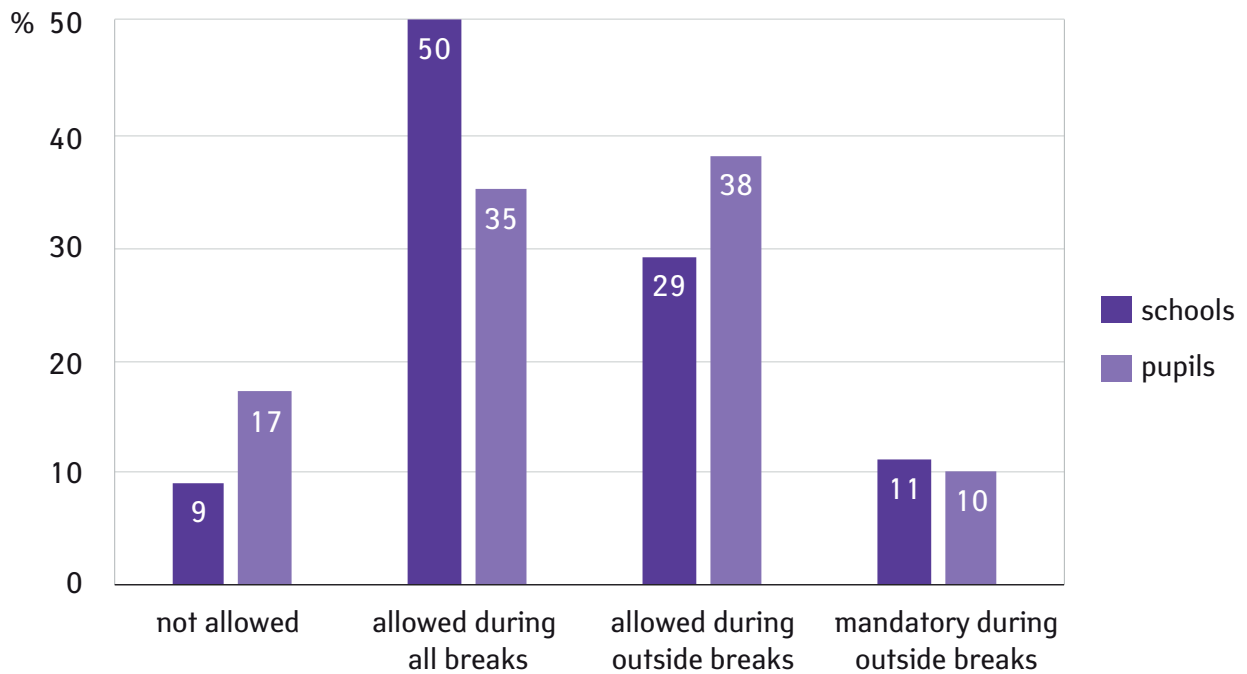


**Figure 2.3.** Weekly duration (minutes per week) of physical education lessons by schools (N=381) and pupils (N=12,700), %

### 4. Playing outside during breaks

The school record form questions were also aimed at determining whether the pupils were allowed to play outside during study breaks and whether it was mandatory or not. Playing outside during breaks was allowed in half of the schools, constituting a little over a third of all pupils. More than a quarter of the schools allowed playing outdoors during specific outside breaks, equalling to about 2/5 of the pupils. Playing outside was mandatory in 11% of the schools (10% of pupils) and in a tenth of the schools, playing outside was prohibited at all times (17% of pupils). More than half (19) of the schools that did not allow playing outside were located in Harju County (all but one in Tallinn), a quarter in Ida-Viru County (eight schools), three schools in Tartu County, two in Põlva County and one in Jõgeva, Järva and Lääne counties.

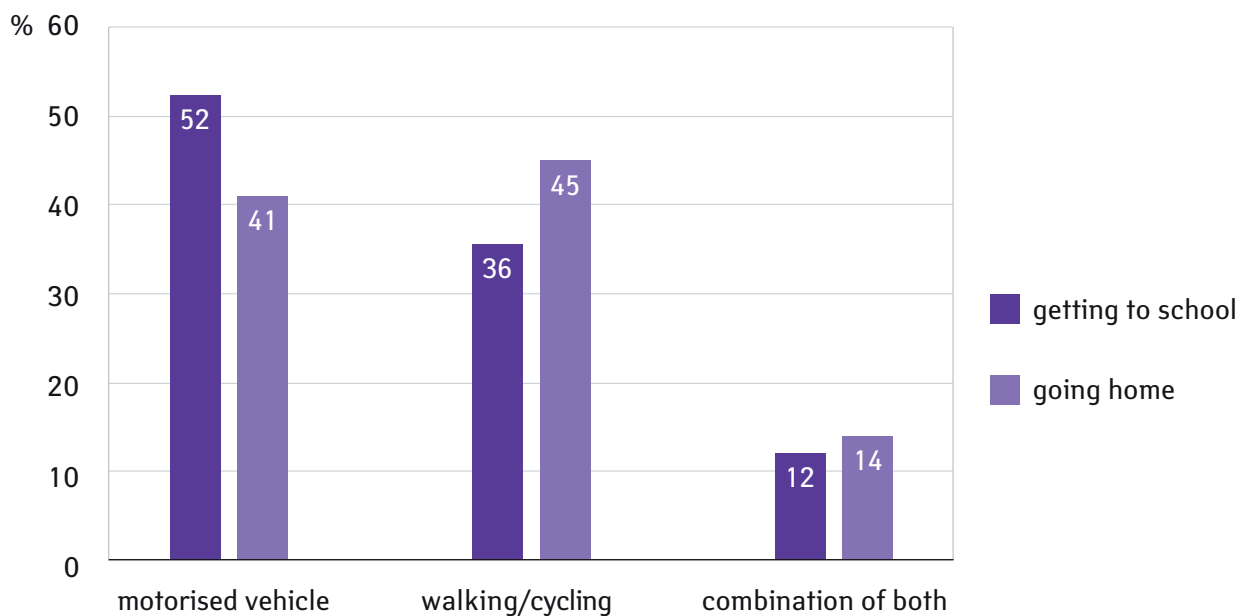




**Figure 2.4.** Playing outside during breaks by schools (N=378) and pupils (N=12,676), %

## 5. Getting to and from school

Almost a half of all pupils used a motorised vehicle to get to school, while the number of pupils who used motorised vehicles for leaving school was a fifth smaller (Figure 2.5). A little over a third (36%) walked or cycled to school and 45% used this means of transportation for going home. More than 10% of the pupils used a combined method of transportation (both walking/cycling and motorised vehicles) for getting to and from school. Over a third of the pupils (35%) always walked or cycled, 40% always used a motorised vehicle and about a quarter (26%) always used the combined method of transportation.



**Figure 2.5.** Means of transportation when getting to school and going home (N=12,700), %

Pupils living in towns were more physically active on their route to and from school than pupils living in boroughs or villages. Children who lived in villages used a motorised vehicle for transportation significantly more than children who lived in boroughs and towns; in fact, the percentage was twice as high when comparing villages and towns (Table 2.2). Walking or cycling was therefore more common in towns than in boroughs or villages, and when comparing children living in villages to those living in towns, the difference was more than threefold.

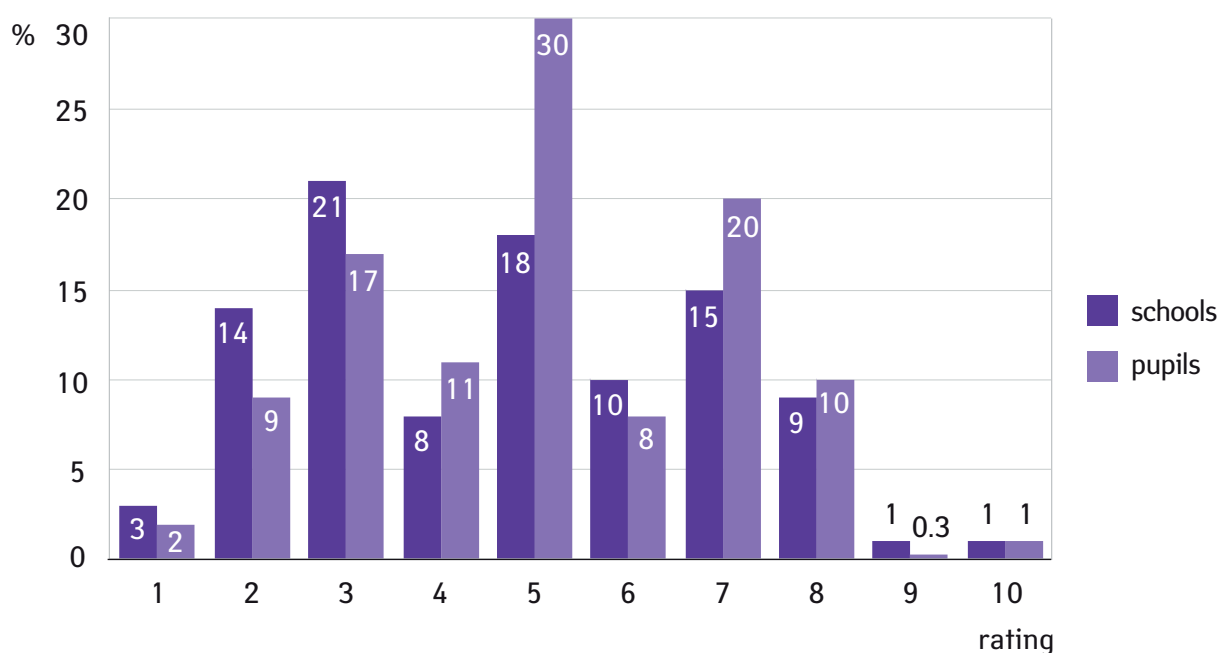
**Table 2.2.** Means of transportation when getting to and from school by type of settlement

Type of settlement	N	Walking/cycling	Motorised vehicle	Combination of both
		%		
<b>Town</b>	8,454	40	33	27
<b>Borough</b>	1,843	37	36	27
<b>Village</b>	2,382	12	67	21

The safety of the route to and from school was evaluated on a scale of one to ten where 1 stood for extremely safe and 10 for extremely unsafe.

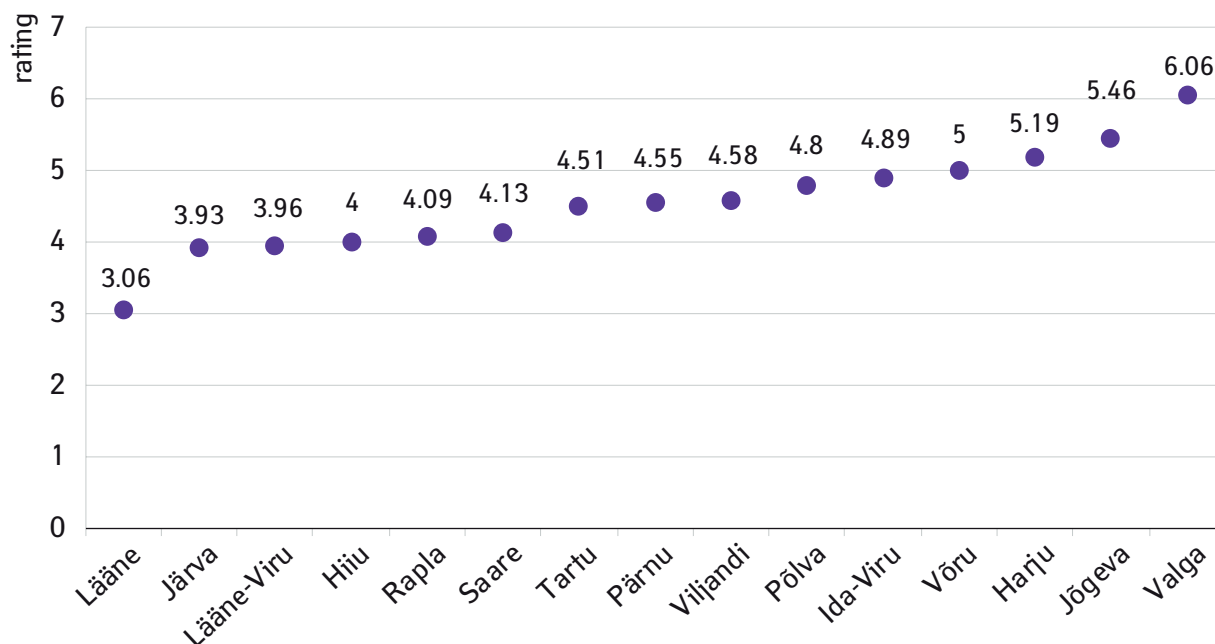
The average safety rating for schools was 4.7 (SD 2.1) and the median value was 5. Almost 2/5 of the schools (38%) considered the route to and from their school to be equal to three of the lowest (best) ratings (Figure 2.6). The rating 3 was used most often—by more than a fifth of the schools. A little under 2/3 of the schools (64%) gave the route a positive rating (1–5). The upper end of the scale (the three ratings standing for the most dangerous route) was used by 11% of the schools, although most of them opted for 8.

The average safety rating was slightly worse for pupils (5.1) than for schools (4.7); the median value remained at 5 for both. The route to and from school was rated to be at the safer side of the scale for three fifths of the pupils, while 2% of the pupils were at the upper end of the scale with ratings of 9 or 10 (Figure 2.6)



**Figure 2.6.** The rating given by school representatives to the safety of the pupils' route to and from school on a scale of one to ten (the smaller the number the safer the route), by schools (N=379) and pupils (N=12,691), %

When comparing the ratings by counties, the school routes in Lääne County were considered the safest (average rating of 3.1) and the school representatives in Jõgeva and Valga counties rated their pupils' routes to school to be the least safe (average ratings of 5.5 and 6.1, respectively) (Figure 2.7).



**Figure 2.7.** The average rating given by school representatives to the safety of the pupils' route to and from school on a scale of one to ten (the smaller the number the safer the route), by county

## 6. Extracurricular sports and physical activities

The study also gathered data on different extracurricular sports or physical activities organised for the primary school classes (by the school itself or by sports clubs and non-profits), and whether these activities and classes were provided for free or for a fee. A little over 3/4 of schools (76%) provided the opportunity to join an extracurricular sports activity for free, while 16% of schools only provided such activities for a fee, and 7% of schools did not offer extracurricular physical activities at all (Figure 2.8). For pupils, the availability of a free extracurricular sports activity decreased to around 2/3 (64%) and the possibility of joining a paid activity increased to 28%. Similarly to schools, 7% of pupils also lacked the opportunity to join such sports activities altogether.

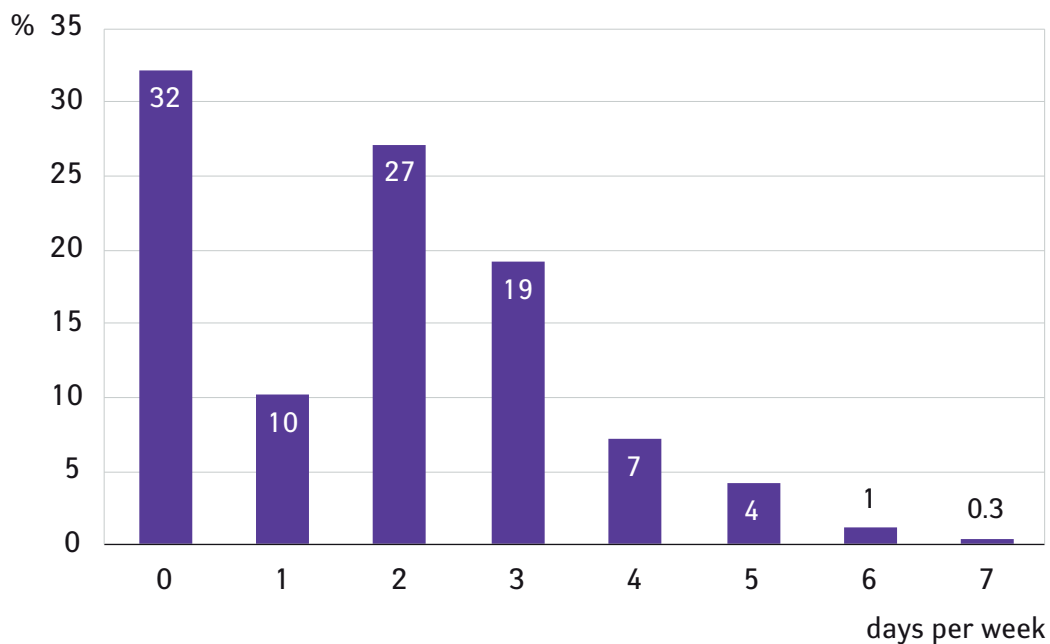
The opportunities of engaging in extracurricular sports varied by county. A total of 59 schools only offered paid activities, most of which (75%) were located in Harju County, followed by Ida-Viru (9%), Tartu (7%), and Põlva counties (3%). Slightly less than a third of all pupils only had the opportunity to join a paid activity, 84% of whom lived in Harju County, 7% in Ida-Viru County, 6% in Tartu County and 1% in Põlva County. In Hiiu, Jõgeva, Lääne, Lääne-Viru, Valga, Viljandi and Võru counties, there were no schools that offered only paid sports activities.



**Figure 2.8.** The availability of extracurricular sports programs by schools (N=378) and pupils (N=12,671), %

## 7. Being a member of a sports club

In addition to the extracurricular physical activities provided by the school, each child's physical activity routine was also examined separately by asking if and on how many days of the week the child attended a sports club or engaged in extracurricular sports. More than 2/3 (68%) of all pupils attended a physical activity after school hours (Figure 2.9), most pupils engaged in these activities two or three times a week, 27% and 19% respectively.

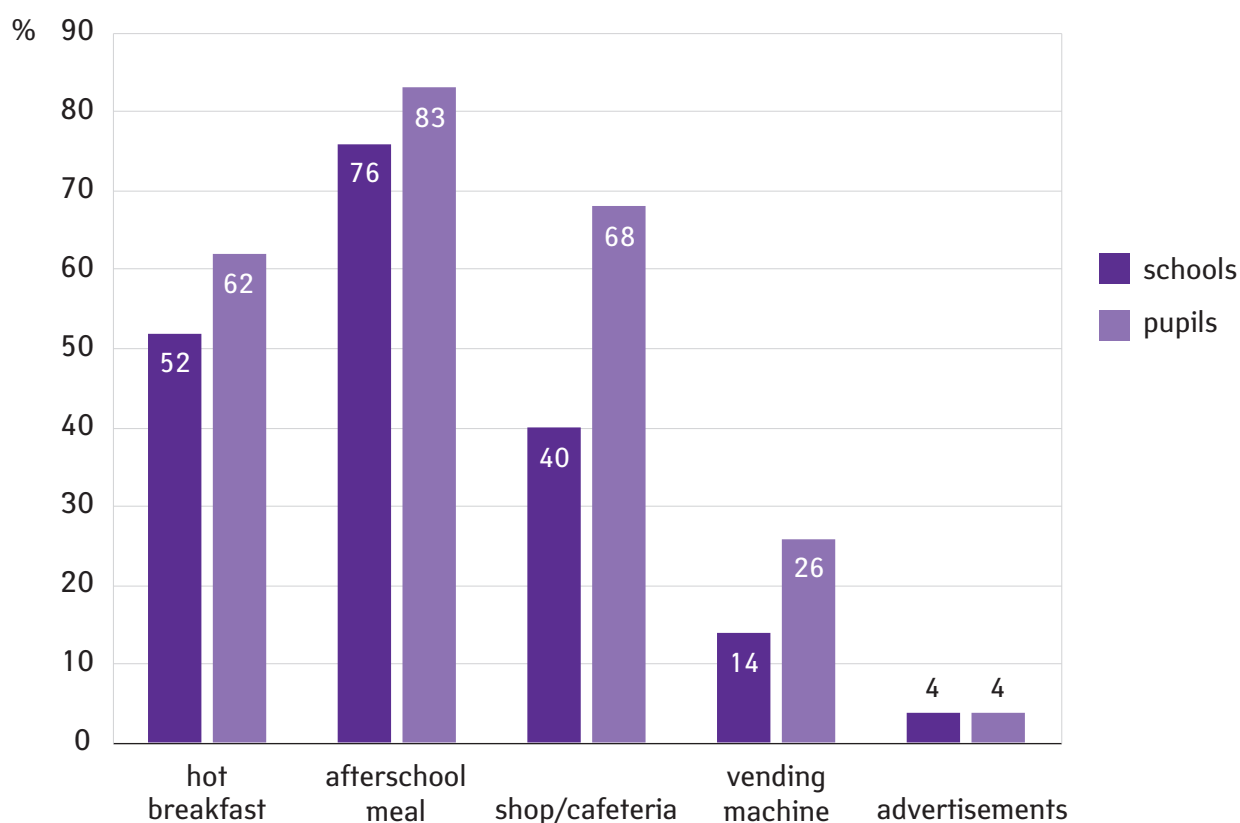


**Figure 2.9.** The number of days spent in a sports club per week (N=12,700), %

## 8. Foods and beverages available at school

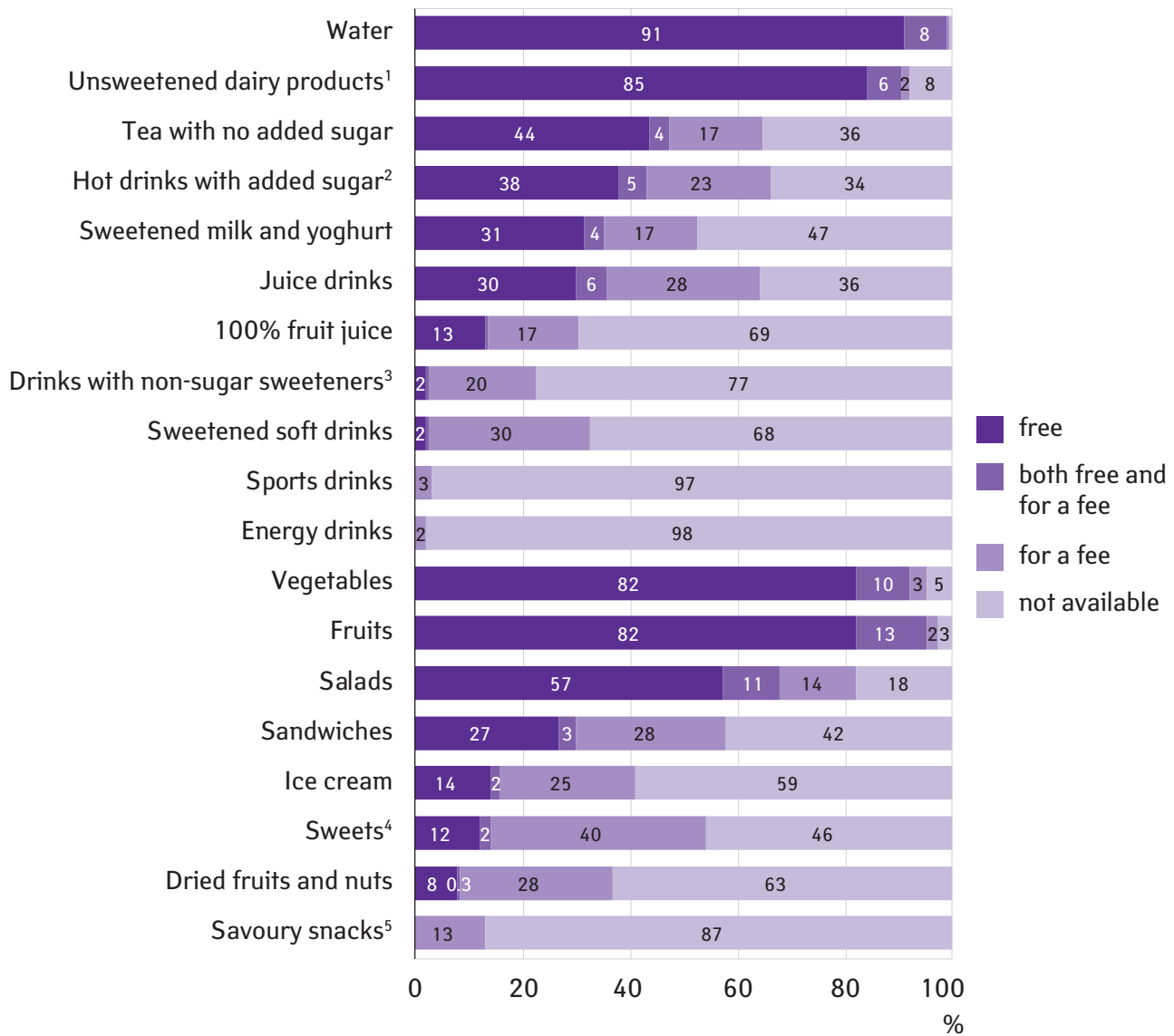
Half of the schools (62% of pupils) offered a hot breakfast in the mornings and 3/4 of the schools (83% of pupils) offered all children the opportunity to eat an afterschool meal (Figure 2.10). Two-fifths of schools (68% of pupils) had a shop or cafeteria on the school premises, and every seventh school had a vending machine, amounting to about a fourth of the pupils.

Advertising and marketing of energy-dense and nutrient-poor foods and beverages that could undermine the promotion of a healthy, balanced diet was rather rare. Such advertisements were only present in 4% of the schools (4% of the pupils as well).



**Figure 2.10.** The prevalence of advertisements and the availability of a shop/cafeteria, vending machine, hot breakfast and afterschool meal by schools (N=381) and pupils (N=12,700), %

In most schools, water (98%), fruits (95%), vegetables (92%) and unsweetened dairy products (90%) were available to the pupils free of charge (Figure 2.11). Energy and sports drinks were available in a small number of schools: 2% and 6% respectively. Sugary soft drinks, on the other hand, were offered in 32% of the schools, and juice drinks were even more prevalent with 64%. However, 100% fruit juices were only available in a third of the schools. More than half of the schools (54%) offered various sweets and 2/5 of the schools had ice cream available for the pupils. The availability of savoury snacks was slightly more limited, with only 13% of the schools providing them to their pupils. About eight out of ten schools offered salads and 3/5 of the schools offered sandwiches, while dried fruits and nuts were only available in 37% of the schools.



**Figure 2.11.** Foods and beverages available at schools (N=381), %

<sup>1</sup> Unsweetened dairy products: milk, yoghurt, kefir, unflavoured drinking yoghurt

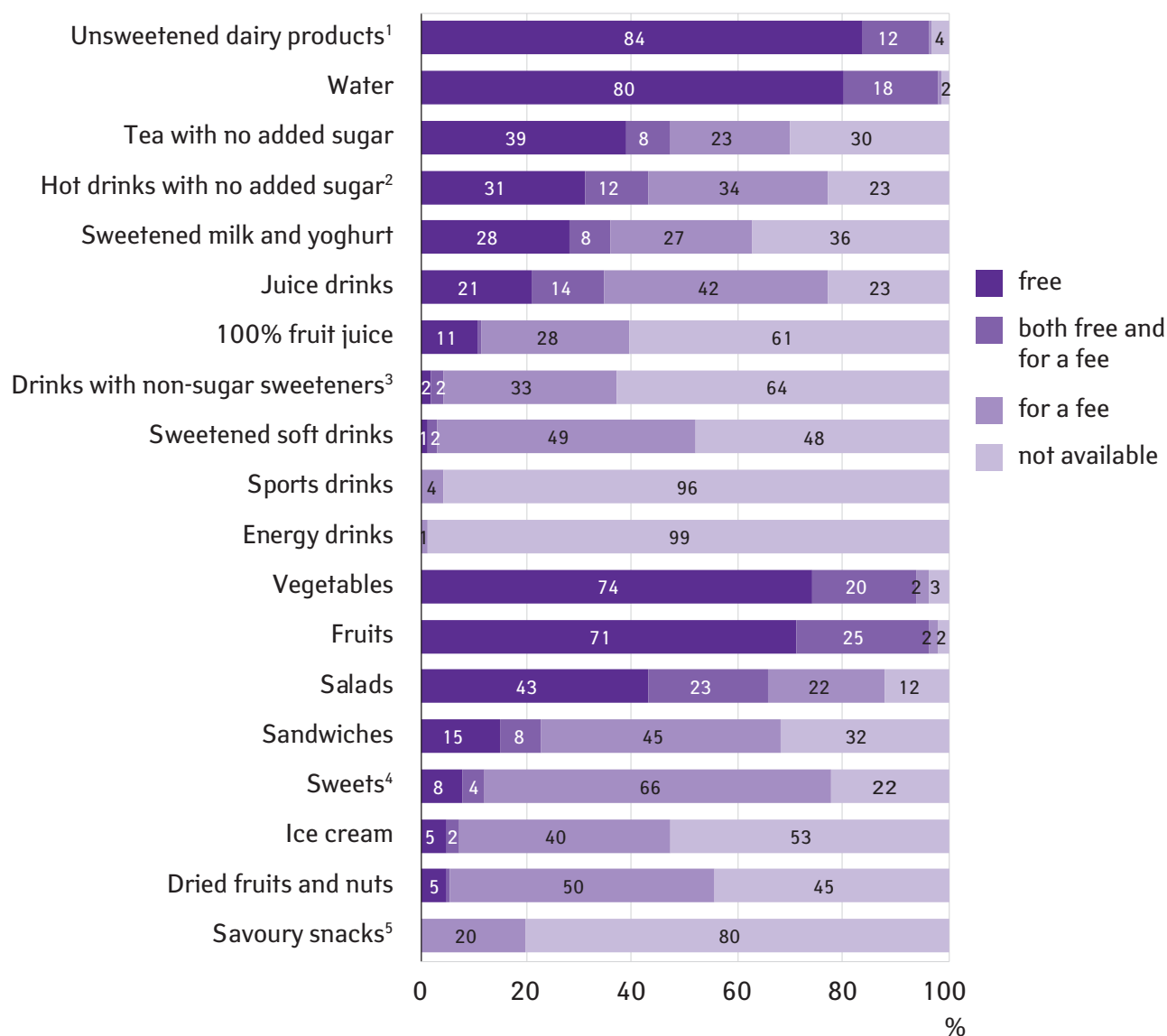
<sup>2</sup> Hot drinks with added sugar: cocoa, tea, latté

<sup>3</sup> Drinks with non-sugar sweeteners: soft drinks (including diet soft drinks, fruit juices and milk drinks) that contain non-sugar sweeteners

<sup>4</sup> Sweets: chocolate, sugar confectionery, cakes, breakfast and/or cereal bars, sweet biscuits and/or pastries

<sup>5</sup> Savoury snacks: potato crisps, salted popcorn, salted nuts, savoury biscuits and/or pretzels

When looking at pupils, the situation was similar: for most of the pupils, water, unsweetened dairy products, vegetables and fruits were available free of charge, while energy and sports drinks were unavailable for the majority of pupils (Figure 2.12). More than a half of the pupils were able to purchase sugary soft drinks and more than 3/4 of pupils had the opportunity to buy juice drinks. Various sweets were even more readily available—almost 4/5 of the pupils had the opportunity to obtain sweet snacks, while ice cream was a little less common (about 2/5 of the pupils had the opportunity to buy it at school). As for savoury snacks, the situation was slightly more promising with only a fifth of all pupils having these snacks available at school.



**Figure 2.12.** Foods and beverages available at school for pupils (N=12,700), %

<sup>1</sup> Unsweetened dairy products: milk, yoghurt, kefir, unflavoured drinking yoghurt

<sup>2</sup> Hot drinks with added sugar: cocoa, tea, latté

<sup>3</sup> Drinks with non-sugar sweeteners: soft drinks (including diet soft drinks, fruit juices and milk drinks) that contain non-sugar sweeteners

<sup>4</sup> Sweets: chocolate, sugar confectionery, cakes, breakfast and/or cereal bars, sweet biscuits and/or pastries

<sup>5</sup> Savoury snacks: potato crisps, salted popcorn, salted nuts, savoury biscuits and/or pretzels

## 9. Other factors related to the school environment

Nutrition education was given as a separate lesson in 3% of the schools, while most schools (85%) integrated nutrition education into other lessons such as personal, social, health and economic education. About a tenth of all schools (12%) did not give nutrition education as a separate lesson nor integrate it into other lessons.

Most participating schools (74%) organised health promoting initiatives and projects in the academic year of 2015/2016 for all first-grade classes and 1% of schools in at least one first-grade class, 22% of schools did not organise such projects. The rest of the schools did not provide an answer for this question, giving reason to assume that they did not organise such initiatives and projects during the given academic year. When analysing the data by classes, the results show that 575 classes out of 750 (77%) were involved in health promoting projects. The percentage was similar among pupils—78%.

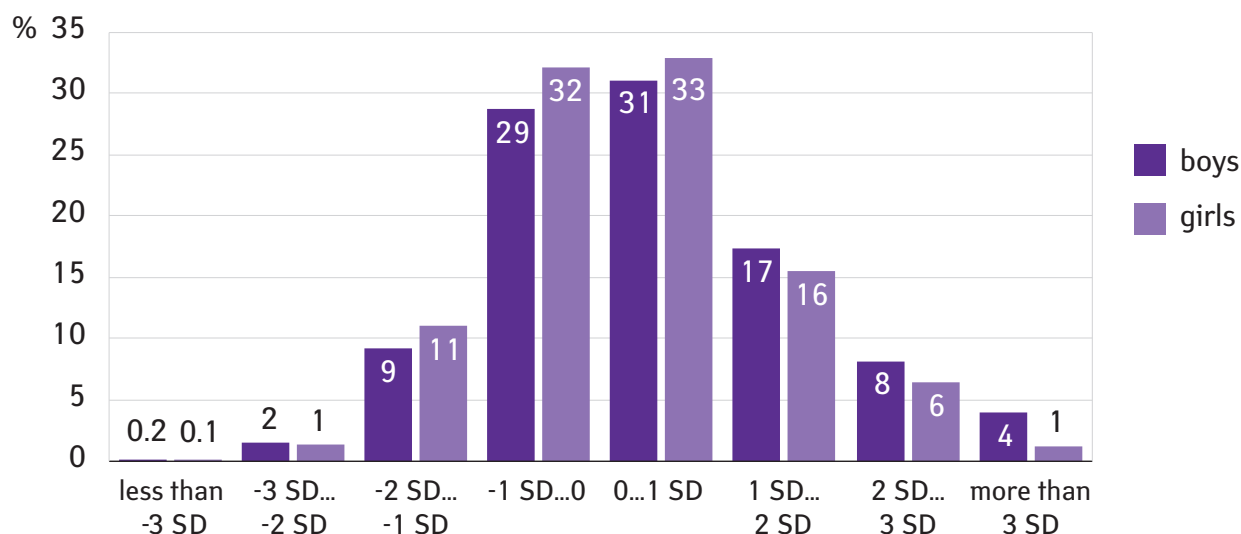
### III ANTHROPOMETRIC MEASUREMENTS

#### 1. Overview

Of all participating pupils 72% (9,146 pupils) were in the normal weight range, 16% (2,086) were overweight, 10% (1,260) obese, and 1.6% (208) underweight. The latter group of children was included in the normal weight group in all further analysis. Overweight and obesity was more prevalent among boys than girls: 29% versus 23% ( $\chi^2=90.7$ ,  $p<0.001$ ), (Table 3.1). The variation between sexes mostly resulted from the higher percentage of obesity among boys (12% among boys and 8% among girls) ( $\chi^2=75.1$   $p<0.001$ ). Moreover, extreme obesity (BMI over 3 SD) was three times more prevalent among boys than girls (Figure 3.1). A little over a fourth of both 7-year-olds and 8-year-olds were overweight or obese (27% and 26%, respectively). There was no statistically significant association found between age and BMI.

**Table 3.1.** Body mass index categories by sex and age

Sex	Age (yrs)	N	Underweight	Normal weight	Overweight	Obesity
			%			
Boys	7	3,006	1.5	70	17	12
	8	3,496	2.0	68	18	13
	<b>Total</b>	<b>6,502</b>	<b>1.8</b>	<b>69</b>	<b>17</b>	<b>12</b>
Girls	7	3,285	1.2	76	15	8
	8	2,913	1.6	76	16	7
	<b>Total</b>	<b>6,198</b>	<b>1.4</b>	<b>76</b>	<b>16</b>	<b>8</b>
Total	7	6,291	1.4	73	16	10
	8	6,409	1.8	71	17	10
	<b>Total</b>	<b>12,700</b>	<b>1.6</b>	<b>72</b>	<b>16</b>	<b>10</b>



**Figure 3.1.** Body mass index categories according to WHO growth reference data (WHO 2007) by standard deviations<sup>1</sup> (SD) (N=12,700), %

<sup>1</sup> underweight less than -2 SD, normal weight between -2 SD and +1 SD, overweight more than +1 SD and less than +2 SD, obesity more than +2 SD



Table 3.2 shows the descriptive statistics of anthropometric measurements by age and sex. The average anthropometric values of boys were higher than those of girls in all categories.

**Table 3.2.** Anthropometric measurements by sex, age, average value, standard deviation, median value, quartiles (P25 and P75) and minimum/maximum value (N=12,700)

Indicator	Sex	Age (yrs)	N	Average	SD	Median	P25	P75	MIN	MAX
<b>Weight (kg)</b>	Boys	7	3,006	28.6	5.9	27.3	24.7	31.0	15.8	64.9
		8	3,496	30.5	6.6	29.0	26.1	33.4	17.1	83.0
	Girls	7	3,285	27.6	5.7	26.4	23.8	30.1	15.4	67.1
		8	2,913	28.9	6.0	27.8	25.1	31.5	15.7	66.4
<b>Height (cm)</b>	Boys	7	3,006	130.3	5.6	130.2	126.5	130.2	111.7	149.9
		8	3,496	133.4	5.8	133.3	129.5	137.3	110.5	155.6
	Girls	7	3,285	129.1	5.6	129.0	125.1	132.8	109.5	150.0
		8	2,913	131.9	5.7	132.0	128.1	135.6	111.5	153.7
<b>Waist circumference (cm)</b>	Boys	7	3,006	58.5	6.5	57.3	54.5	57.3	36.5	96.6
		8	3,496	59.8	7.2	58.2	55.1	63.0	34.3	106.3
	Girls	7	3,285	57.0	6.4	56.0	53.0	60.0	39.1	92.1
		8	2,913	57.7	6.7	56.3	53.2	61.0	42.1	99.0
<b>Hip circumference (cm)</b>	Boys	7	3,006	68.5	6.6	67.5	64.0	67.5	49.7	101.1
		8	3,496	70.1	7.0	69.0	65.0	74.0	49.1	108.8
	Girls	7	3,284	68.0	6.4	67.0	63.5	71.2	50.0	100.0
		8	2,912	69.2	6.4	68.1	64.8	72.7	53.7	110.0
<b>BMI</b>	Boys	7	3,006	16.7	2.5	16.1	15.1	17.6	12.0	32.2
		8	3,496	17.0	2.8	16.3	15.2	18.0	10.8	39.9
	Girls	7	3,285	16.5	2.5	15.9	14.8	17.5	8.8	33.1
		8	2,913	16.6	2.6	16.0	14.8	17.6	11.6	35.1

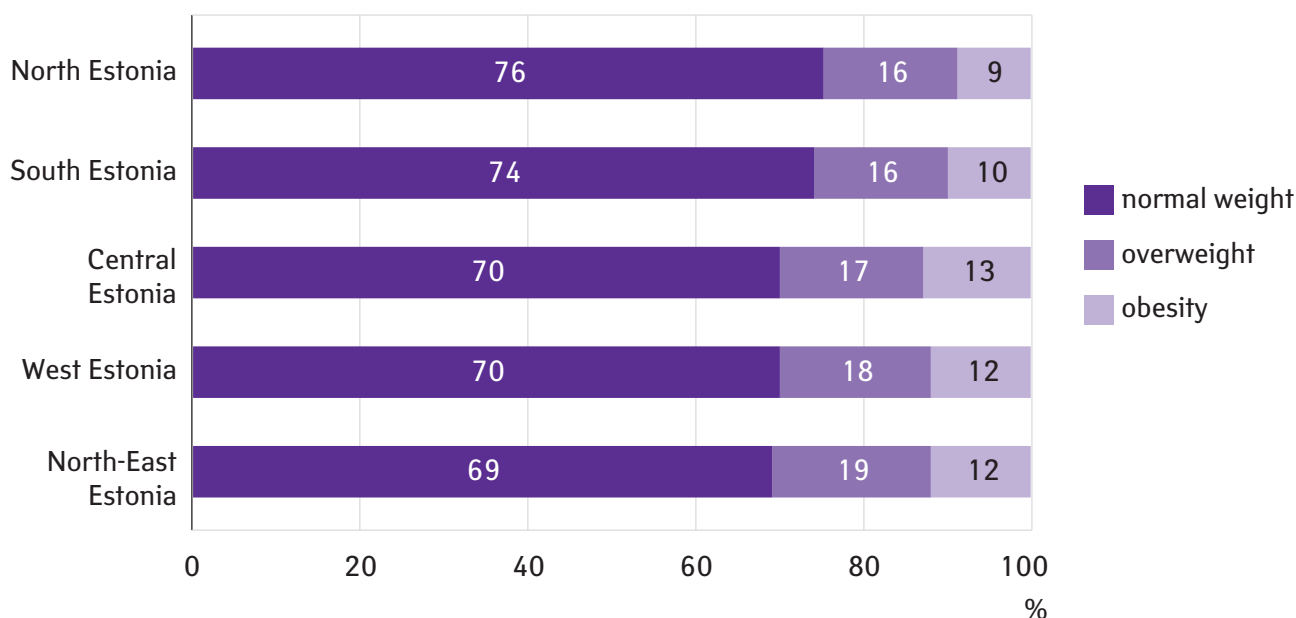
## 2. Body mass index categories by background data

The BMI results differed by county. There were fewer overweight and obese children in counties with larger administrative centres such as Harju and Tartu counties (Table 3.3). Among girls, however, Põlva County had the lowest percentage of overweight and obesity. The highest percentage of children with excess body weight lived in Hiiu and Lääne counties. The biggest difference between sexes was observed in Põlva County, where the number of overweight and obese boys was almost twice as high as that of girls. In Hiiu County, however, there were more overweight and obese girls than boys, and in Valga and Järva counties, there was no significant difference observed between boys and girls. When only looking at obese pupils, there was practically no difference between the sexes in Hiiu County and the situation in Valga and Järva counties changed as well: the percentage of obese boys was higher than that of the girls.

**Table 3.3.** Body mass index categories by sex and county (N=12,700)

County	N			Normal weight, %			Overweight, %			Obesity, %		
	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
Hiiu	41	32	<b>73</b>	66	59	<b>63</b>	17	25	<b>21</b>	17	16	<b>16</b>
Lääne	113	111	<b>224</b>	62	68	<b>65</b>	22	20	<b>21</b>	16	12	<b>14</b>
Valga	129	122	<b>251</b>	67	67	<b>67</b>	19	21	<b>20</b>	14	12	<b>13</b>
Rapla	197	171	<b>368</b>	64	73	<b>68</b>	20	16	<b>19</b>	16	11	<b>13</b>
Järva	145	141	<b>286</b>	68	69	<b>69</b>	17	20	<b>18</b>	15	11	<b>13</b>
Ida-Viru	578	512	<b>1,090</b>	65	73	<b>69</b>	20	17	<b>19</b>	15	10	<b>12</b>
Saare	138	135	<b>273</b>	65	74	<b>70</b>	20	19	<b>19</b>	15	7	<b>11</b>
Viljandi	228	205	<b>433</b>	68	77	<b>72</b>	18	14	<b>16</b>	14	9	<b>12</b>
Jõgeva	109	114	<b>223</b>	67	78	<b>72</b>	20	18	<b>19</b>	13	4	<b>9</b>
Lääne-Viru	230	205	<b>435</b>	69	76	<b>73</b>	17	13	<b>15</b>	14	11	<b>12</b>
Põlva	105	94	<b>199</b>	65	81	<b>72</b>	21	10	<b>16</b>	14	9	<b>12</b>
Pärnu	322	312	<b>634</b>	71	75	<b>73</b>	17	16	<b>16</b>	12	9	<b>11</b>
Võru	127	115	<b>242</b>	67	81	<b>74</b>	20	14	<b>17</b>	13	5	<b>9</b>
Harju	3,357	3,261	<b>6,618</b>	72	79	<b>75</b>	17	15	<b>16</b>	11	6	<b>9</b>
Tartu	683	668	<b>1,351</b>	73	79	<b>76</b>	14	14	<b>14</b>	13	7	<b>10</b>

Due to the differences between counties, there was also a lower percentage of overweight and obese children in North and South Estonia (approximately 1/4), the highest percentage was observed in North-East Estonia (Figure 3.2). The prevalence of obesity was highest in Central Estonia and lowest in North Estonia.



**Figure 3.2.** Body mass index categories by region<sup>1</sup> (N=12,700), %

<sup>1</sup> Region defined according to the NUTS 3 (*Nomenclature des unités territoriales statistiques*) classification:

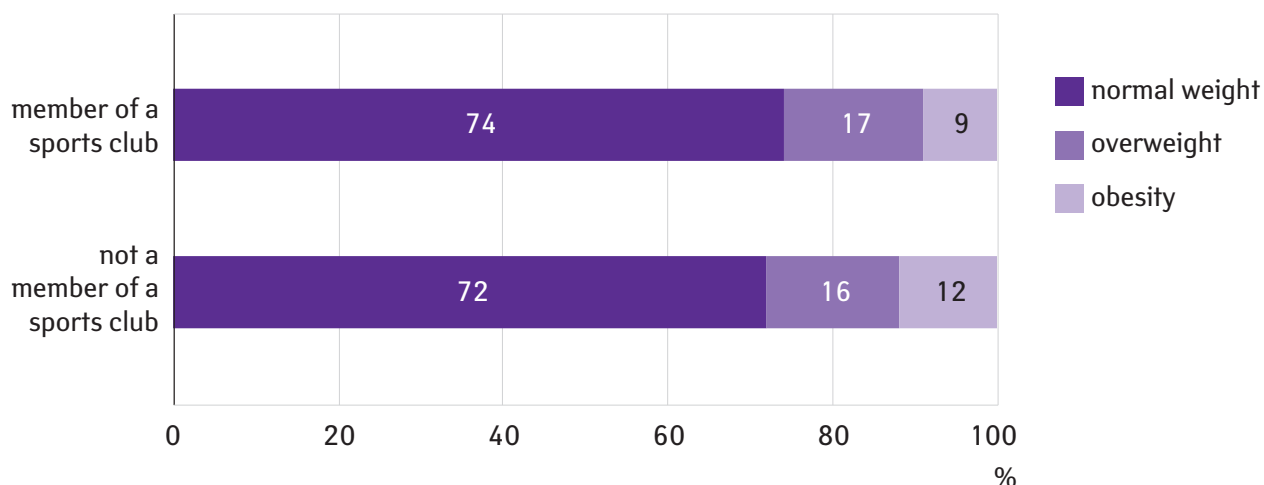
- North Estonia – Harju County
- West Estonia – Hiiu, Lääne, Pärnu and Saare counties
- Central Estonia – Järva, Lääne-Viru and Rapla counties
- North-East Estonia – Ida-Viru County
- South Estonia – Jõgeva, Põlva, Tartu, Valga, Viljandi and Võru counties

When examined by types of settlement, the BMI categories were similar in all groups (Figure 3.3). Almost every sixth child was overweight and every tenth obese, regardless of whether the child lived in a town, borough or village.



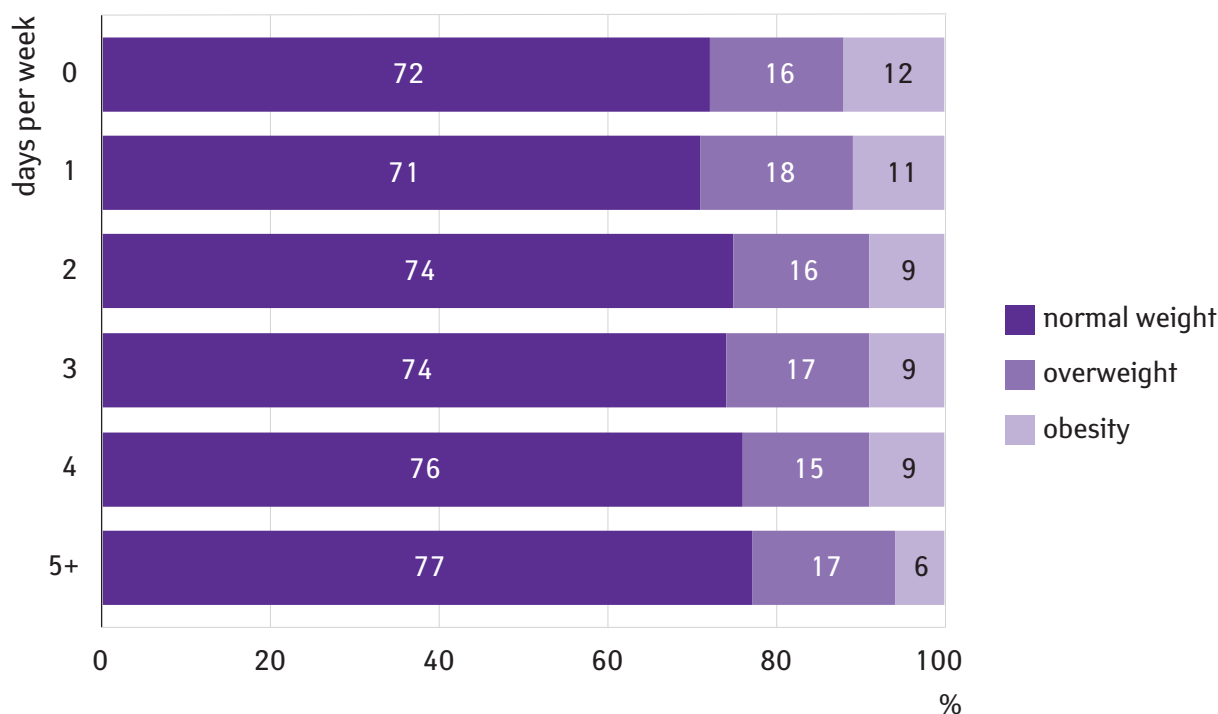
**Figure 3.3.** Body mass index categories by types of settlement (N=12,681), %

Being a member of a sports club or engaging in extracurricular sports was positively associated with the children’s body weight. Excess body weight was less prevalent among those who participated in extracurricular physical activity classes, and the association was even stronger when only considering obesity:  $\chi^2=21.2$ ,  $p<0.001$  (Figure 3.4).



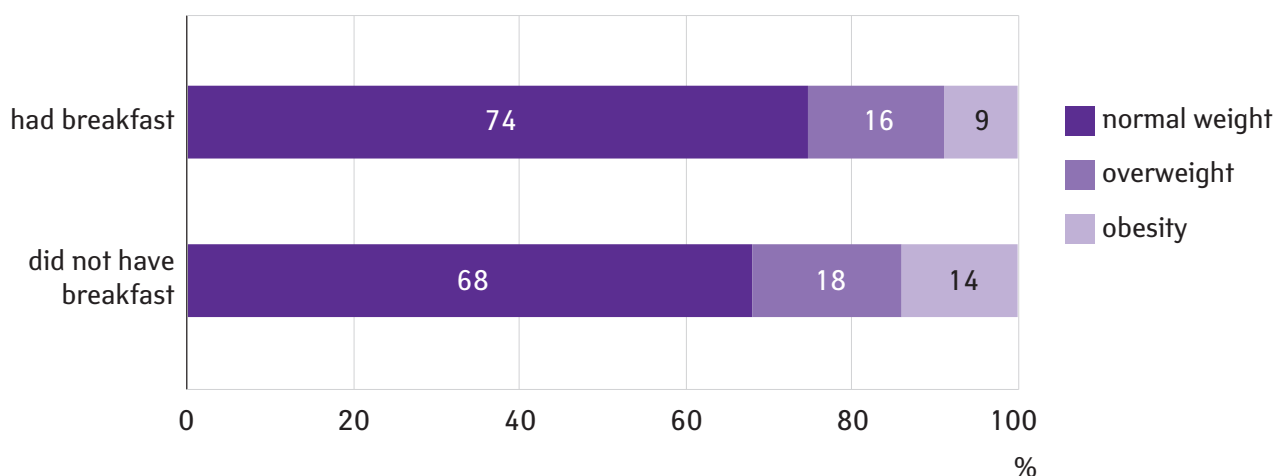
**Figure 3.4.** Body mass index categories by being a member of a sports club (N=12,700), %

BMI was also associated with the frequency of engaging in extracurricular sports (Figure 3.5). A higher number of days spent in a sports club per week was linked to a lower percentage of overweight ( $\chi^2=17.5$   $p=0.004$ ) and obesity ( $\chi^2=36.5$   $p<0.001$ ). It is important to note, however, that only a small number of children engaged in extracurricular sports for six or seven days of the week (1.2% and 0.3%, respectively).



**Figure 3.5.** Body mass index categories by the number of days spent in a sports club per week (N=12,700), %

An association was also observed between BMI and eating breakfast (Figure 3.6). The group of children who had eaten breakfast prior to the study (89%) had a lower percentage of overweight than those who had skipped the morning meal ( $\chi^2=22.0$   $p<0.001$ ). The association with obesity was even stronger:  $\chi^2=24.6$   $p<0.001$ . When interpreting these results, it should be kept in mind that the children were only asked about their breakfast on the day of the study, and therefore it may not be an accurate representation of their daily habits.



**Figure 3.6.** Body mass index categories by eating breakfast on the day of the study (N=12,700), %

There was no statistically significant association between BMI and the means of getting to and from school (Table 3.4). Neither were the physical activity related factors in the school environment (availability of playgrounds/gyms and playing outside during breaks) associated to children's BMI. Similarly, the associations between BMI and the rest of the school environment factors, such as providing access to a

shop/cafeteria and vending machines, organising health promoting initiatives and projects, and advertising energy-dense or nutrient-poor foods were not statistically significant (Table 3.5).

**Table 3.4.** Body mass index categories by physical activity possibilities related to the school environment

Physical activities related to the school environment		N	Normal weight	Overweight	Obesity
			%		
<b>Getting to and from school</b>	Walking/cycling	4,376	73	16	10
	Motorised vehicle	5,062	74	17	10
	Combination of both	3,260	73	16	10
<b>Playing outside during breaks</b>	Mandatory during specific outside breaks, otherwise voluntary	79	72	19	9
	Mandatory during specific outside breaks	1,158	78	15	7
	Allowed during all breaks	4,482	73	17	11
	Only allowed on specific outside breaks	4,771	74	16	10
	Not allowed	2,187	72	18	10
<b>Possibility of using a playground</b>	Yes	9,648	74	16	10
	No	3,052	73	17	10
<b>Possibility of using a gym</b>	Yes	11,719	74	17	10
	No	981	75	16	9
<b>Extracurricular sports provided at school</b>	Free	5,867	72	17	11
	Paid	3,676	75	17	8
	Both free and paid	2,275	76	15	9
	None	882	75	15	10

**Table 3.5.** Body mass index categories by food-related school environment factors

School environment factor		N	Normal weight	Overweight	Obesity
			%		
<b>Access to a shop or cafeteria</b>	Yes	8,609	73	17	10
	No	4,091	75	15	9
<b>Access to a vending machine</b>	Yes	3,279	73	17	10
	No	9,421	74	16	10
<b>Initiatives or projects promoting a healthy lifestyle</b>	Yes	9,908	74	16	10
	No	2,792	72	17	11
<b>Advertising energy-dense or nutrient-poor foods</b>	Yes	485	73	15	12
	No	12,215	74	16	10

## SUMMARY

The fieldwork of the childhood obesity surveillance initiative study took place in spring of 2016, with the initial sample of all first-grade pupils from all Estonian general education schools. After excluding the schools and pupils who refused or were unable to participate, 12,700 pupils (82%) and 381 schools (77%) remained in the final sample. The study included children aged 7–8 years and contained an almost equal number of boys and girls, with a ratio of 51:49 (6,502 boys and 6,198 girls).

Excess body weight was recorded for 26% of all subjects, 2/5 of whom were obese, constituting 10% of the final sample. Both overweight and obesity were more prevalent among boys. Excess body weight was recorded for 23% of all girls, with more than a third of those (8% of all girls) being obese, while the percentage of excess body weight among boys was 29%, with 2/5 of those (12% of all boys) being obese. There was no statistically significant association between BMI and age: a little over a fourth of both 7- and 8-year-olds had excess body weight.

Counties with larger administrative centres such as Harju and Tartu counties had a smaller number of children with excess body weight: 25% and 24%, respectively. Due to this, there were also fewer overweight and obese children in North and South Estonia than in other regions. The highest number of overweight/obese children was observed in Hiiu (37%) and Lääne counties (35%).

The children's BMI had a positive association with factors that were directly related to their daily habits, such as being a member of a sports club, going to the sports club more frequently, and eating breakfast. The school environment factors did not affect the children's BMI, as the study design did not allow for a direct evaluation of how much the children used the opportunities provided by schools, and therefore these factors cannot be used to evaluate the health behaviour of children.

Most schools had their own gym or the opportunity to use another gym nearby; only 2% of all schools (0.8% of pupils) could not use a gym. A large portion of schools also had an outdoor playground on their premises. Besides the number of mandatory physical education lessons set out in the national curriculum, 59% of schools also organised additional physical education lessons, and less than a fifth of all schools had included these extra lessons into the timetable of all first-grade classes. The average weekly length of all physical education lessons in first grades was 137 minutes.

Half of the schools allowed their pupils (35% of all pupils) to play outside during breaks, and in every ninth school playing outside was mandatory during an outside break, while a tenth of the schools did not allow their pupils (17% of all pupils) to play outside at all.

About a half of the pupils (52%) used a motorised vehicle to get to school, and the percentage decreased to 41% when looking at the means of getting home. A little over a third (36%) walked or cycled to school, while a total of 45% reported walking or cycling being their primary means of getting home. More than 10% of the pupils used a combined method of transportation (walking/cycling and a motorised vehicle) for getting to and from school. Children living in towns walked or cycled to and from school more often than those who lived in boroughs or villages.

The safety of the routes to school differed by county, starting from an average rating of 3.1<sup>1</sup> in Lääne County to an average rating of 6.1 in Valga County. The national average safety rating was 4.7. About 2/5 of the schools (38%) rated their routes to school with one of the three lowest ratings, which were considered the safest. Every ninth school, however, rated their route to school with one of the three highest ratings, although many of them found the rating 8 most fitting.

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<sup>1</sup> Safety was evaluated on a scale of one to ten (the smaller the number the safer the route)

Most of the schools provided extracurricular sports activities for pupils: 76% organised such activities for free, 16% only had paid activities, and 7% did not provide such activities at all. When looking at pupils, the opportunity to join a free extracurricular sports activity decreased to 64% and the percentage of paid sports increased to 28%. The percentage of pupils who had no sports activities to join after school hours remained at 7%. About 2/3 (68%) of pupils reported being a member of a sports club, and the prevalence of overweight and obese pupils among them was 2% lower than among those who were not involved in extracurricular sports (26% and 28%, respectively). Although small, the difference proved to be statistically significant. The frequency of participating in extracurricular sports also had a positive association with BMI: the number of overweight and obese children decreased as the frequency increased—there were 29% of overweight and obese pupils among those who took part in an afterschool physical activity once a week, and only 23% among those who engaged in such activities five or more days a week. A majority of the pupils attended extracurricular sports classes two or three times a week.

Of all subjects, 89% had eaten breakfast prior to the study, and this group was also significantly less overweight and obese (26%) than the group who did not eat breakfast (32%). About a half of all schools (2/3 of pupils) offered a hot breakfast to their pupils, and 76% of schools provided an afterschool meal, equalling to more than 4/5 of all pupils. The study did not clarify, however, whether children used these opportunities. In addition to the regular school lunch, 40% of schools (more than 2/3 of pupils) had a shop or cafeteria in which foods and beverages can be purchased. The availability of foods and beverages was similar for both schools and pupils. Water, unsweetened dairy products, fruits and vegetables were mostly available for free. Although the availability of energy and sports drinks was limited (2% and 6% of schools, respectively), 32% of schools (1/2 of the pupils) still had sugary soft drinks available and 64% (more than 3/4 of the pupils) provided the opportunity to buy juice drinks. Sweets were available in 56% of the schools (4/5 of the pupils) and ice cream could be purchased in 41% of the schools (less than half of the pupils). The availability of savoury snacks was slightly more limited (13% of schools, 1/5 of pupils). A fourth of all schools offered salads, 30% of schools offered sandwiches and 29% of schools had dried fruits and nuts available, equalling to about a half of the pupils for all of these foods.

Most schools (85%) had nutrition education as part of another lesson, such as personal, social, health and economic education; 14 schools (3%) had nutrition education as an independent subject and 12% of schools did not teach nutrition education at all. Almost 3/4 of the schools organised initiatives or projects promoting a healthy lifestyle for all first-grade classes, and four schools had these projects for at least one first-grade class; the rest of the schools did not organise such initiatives.



## CONCLUSIONS

From a public health perspective, childhood obesity has proven to be a serious problem in Estonia much like in other European countries, as it increases the risk of developing overweight and other health issues (type II diabetes and cardio-vascular diseases) in adulthood. In order to improve the current situation, it is important to have a thorough and representative set of data, and the COSI study is an excellent way of collecting such data, thereby helping to assess the influence of various interventions.

According to the present study, every fourth first-grade pupil was overweight or obese—a slightly better result than that of the 2014 national dietary survey (NIHD 2016) in which excess body weight was observed for every third (31%) 6- to 9-year-old. Considering the possible health risks, the percentage of overweight and obese children is significant and a definite cause for concern. The primary causes for excess body weight are inadequate exercise and an unbalanced diet—a fact confirmed by the results of this study as well. Based on the current data analysis, reaching or maintaining a healthy BMI can be facilitated by engaging the child in extracurricular sports and ensuring that the child starts their day with a balanced breakfast.

Although the study design does not allow for a direct assessment of the association between school environment factors and BMI, it is great to see that more than half of the schools had more physical education lessons in their curriculum than mandatory. Many schools also organised extracurricular sports, and most of them provided free activities in addition to paid ones. It is also positive that a majority of the first-grade pupils had the opportunity to use a gym and a playground and receive free unsweetened dairy products, vegetables and fruits at school. Still, many schools provided their pupils with sweets and sugary soft drinks and juice drinks which does not promote a healthy diet.



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# APPENDIX 1. CHILDHOOD OBESITY SURVEILLANCE INITIATIVE DATA COLLECTION PROCEDURE

The WHO Regional Office for Europe is establishing a European childhood obesity surveillance system in some countries of the region to monitor routinely the policy response to the emerging obesity epidemic. The system aims to measure trends in overweight and obesity in children aged 6.0–9.9 years in order to gain a correct understanding of the progress of the epidemic and to reverse it, while also allowing intercountry comparisons. This document refers to the agreed common manual of data collection procedures of the WHO European Childhood Obesity Surveillance Initiative (COSI).

## 1. Conducting the study in Estonia

This year marks the first time Estonia participates in the childhood obesity surveillance initiative. According to the study plan, all pupils attending first grade in the academic year 2015/2016 will be measured. The measurements would be carried out in April and May of 2016. The study was coordinated by the National Institute for Health Development who, according to WHO guidelines, would prepare the necessary manuals and data collection forms, collect the data into a uniform database, clean the data and send it to WHO.

### Carrying out the measurements at school

The measurements are carried out by a prearranged examiner. All examiners must complete appropriate training beforehand.

If possible, a second examiner should be included in the team. Only a person who has previous experience in the anthropometric measurement of children or has completed the appropriate training can work as a second examiner. If two examiners can work at a school simultaneously, all measurements (except for body weight) will be taken twice. This means that two people will take the measurements separately and both results will be recorded in the form.

#### The examiner's tasks are to:

- 1) contact the school, its health care provider (school nurse) and the class teachers, settle on a date and time for carrying out the measurements and acquire the children's personal information;
- 2) organise a notification letter to the parents. To do so, the class teacher should be asked to forward an email to all the parents, explaining the study process and asking for their consent;
- 3) carry out the measurements in each class according to the manual; explain the procedure to the second examiner (e.g. the school nurse) before taking the measurements;
- 4) complete the mandatory data collection forms (children's dataset) and send them to the field work coordinator electronically;
- 5) organise the completion of the on-paper school record form by the school representative and send the completed forms to the field work coordinator.

## 2. Administration of the child's record form and measurement techniques

**NB!** All of the data collected for each child will be entered into an electronic Excel file by the examiner. A paper form may be used to write down measurements. All data written on paper forms must be entered into an electronic file.

### CHILD'S PERSONAL INFORMATION

**NB!** The following personal information should be recorded before taking any measurements. The information needed (a list of all first-grade pupils along with addresses and dates of birth) should be enquired from the school representative beforehand, preferably in Excel format.

#### (1) Child's identification code

**NB!** This should be recorded before the data is collected. If the child refuses to participate or is absent on the day of the study, he/she will keep their code—the code cannot be given to another child.

The child's identification code includes 13 characters, for example **EST1601451208**

The code comprises of the following parts:

**Country code.** Consists of three letters: **EST**

**Year.** The last two digits of the data collection year: **16**

**School code.** Each participating school is given a four-digit code. If the school code is 1, **0001** should be entered in the form, if the code is 10 or 100, **0010** and **0100** should be entered, respectively.

**NB!** The country code, year and school code is entered in the same box. For example: EST160100

**Grade.** The grade number of a first-grade pupil is **1**. Only first-grade pupils are measured in 2016, so no other numbers can be entered.

**Parallel class number.** Parallel first-grade classes should be indicated with numbers starting from 1. Even if these classes are normally indicated with letters (e.g. A), the first parallel class should be indicated with **1**, the second parallel class with the number **2**, etc. If there is only one first-grade class, it should be indicated with the number 1.

**Child's code.** A two-digit code. The examiner will assign a code for each pupil in the class—the first pupil will be given the code 01, the second pupil will be given the code 02, etc.

**NB!** The grade number, parallel class number and child's code is entered in the same box. For example: 1101.

(2) **Child's sex.** Enter as a number: 1 (male) or 2 (female).

(3) **Child's date of birth.** Enter as follows: Day (01 to 31). Month (01 to 12). Year (four digits). For example: 01.01.2007

(4) **Child's place of residence.** Enter as a number:

1 - Town;

2 - Borough;

3 - Small borough;

4 - Village

## ANTHROPOMETRIC EXAMINATION

- (5) **Date of measurement.** For example 05.04.2016
- (6) **Approximate time of measurement.** Enter as a number: 1 (before school lunch) or 2 (after school lunch).
- (7) **Child's assent.** Enter as a number:
- 1 - Child agrees to be measured
  - 2 - Child does not agree to be measured
  - 3 - Child was absent on the day of measurement
  - 4 - Parent did not give consent for their child to be measured
- (7a) **Child's reason for refusal.** Ask the child why he/she does not agree to be measured. Let the child talk, and tick the most appropriate answer option.
- NB!** This answer should be recorded only if the child does not agree to be measured *at all*. If the child, for instance, agrees to measurement of his or her weight or height, code "Yes".
- (8) **Breakfast.** The child is asked whether they had anything for breakfast apart from water, milk or juice. Enter as a number: 1 (the child had breakfast) or 2 (the child did not have breakfast).

## MEASUREMENT ITEMS

Before weighing children, ask them to take off their shoes and socks, all heavy clothing (e.g. coat, pullover, jacket), wallets, mobile phones, key chains, belts and other objects. Children should be weighed in their underwear. If the child does not agree to this, they can wear light clothing. Also, undo any hair ornaments or braids if they are of significant weight and/or interfere with the height measurement.

Perform the anthropometric examination according to the techniques described below. The order in which the measurements are presented is that in which it is suggested they be taken.

- (9) **Weight** should be measured in kilograms and recorded to the nearest 100 g (0.1 kg) unit. For instance, if the weight is 22.3 kg, it is entered in the designated boxes as follows: 22.3.
- (10) **Height** should be measured in centimetres and the reading taken to the last completed 1 mm (0.1 cm). For instance, if the height is between 131.4 and 131.5, the figure 131.4 is entered in the designated boxes.
- (11) **Waist** circumference should be measured in centimetres and recorded to the last completed 1 mm (0.1 cm).
- (12) **Hip** circumference should be measured in centimetres and recorded to the last completed 1 mm (0.1 cm).
- NB!** If there is no second examiner to record second measurements, boxes 10a, 11a and 12a are left empty.
- (13) **Clothes worn when measured.** Enter the most appropriate answer as a number:
- 1 - Underwear only
  - 2 - Gym clothes (e.g. shorts and t-shirt only)
  - 3 - Light clothing (e.g. t-shirt, cotton trousers or skirt)
  - 4 - Heavy clothing (e.g. sweater and jeans)
  - 5 - Other

If the child was wearing something other than the mentioned options, enter 5 ("Other") and specify the clothes the child wore when measured.

## ADDITIONAL QUESTIONS FOR THE CHILD

(14) **Getting to and from school.** Ask the child how he/she usually gets to and from school and indicate the most appropriate answer:

- 1 - Walking/cycling
- 2 - Motorised vehicle (car, public transportation)
- 3 - Combination of walking/cycling and motorised vehicles

**NB!** Getting to school and going home should be indicated separately. If the child says he/she usually takes the bus, ask him/her how long it takes to get to the bus stop. If the answer is 10 minutes or more, mark answer No. 3 (Combination of walking/cycling and motorised vehicles).

(15) **Being a member of a sports club.** Ask the child if he/she is a member of any sports clubs or dance classes and enter the answer as a number: 1 (is a member) or 2 (is not a member).

If the child is a member of a sports club, ask him/her how many days a week he/she participates in this sport and enter the appropriate number. You can ask the child to name the weekdays and sports activities he/she engages in and help the child count the number of days. **NB!** The question only concerns sports classes the child attends after school hours, be it on school premises or somewhere else. Make sure that the child does not include physical education lessons that are a part of their curriculum, such as swimming lessons. If the child is not a member of any sports clubs, enter 0.

**Examiner's name.** Enter the name of the examiner. If the measurements were taken by two people, enter both names.

**Observations by examiner.** This space can be used to write any remarks that the examiner considers important or relevant for the examination of a particular child, such as poor cooperation by the child. It can also be used to record observations on the anthropometric examinations, such as why some measurements were not taken or when there was uncertainty about the first measurement taken and a second measurement was done.

## Standardisation of conditions

### Examiners

Before each data collection round, all examiners should be trained in taking standardised measurements as accurately and precisely as possible according to the techniques and instructions given below. Examiners should ensure the basic principles of confidentiality, privacy and objectivity throughout the process.

Children can be very sensitive about their size and that of the children around them. Measuring body height and weight could accentuate this sensitivity and increase the risk for stigmatisation and bullying. Examiners should take measurements in such a way as to minimise any potential for harm. They should not mention the words "childhood obesity" or give any indication that the data are being collected for assessment of the prevalence of overweight and obesity in schoolchildren.

Children have the right to know their height and weight. Although examiners should not give these data routinely, they should give them if they are requested to do so.

### Children

Children should only wear underwear when measured. Therefore, they should be asked to take off their shoes and socks, all heavy clothing (e.g. coats, pullovers, jackets), wallets, mobile phones, key chains, belts and any other objects before the measurements. Furthermore, any hair ornaments or braids should be undone.

Children should never be told the measurements of other children.

### **Instruments**

Only the anthropometric instruments given by the study coordinator are used.

The weighing scales and height board should be checked and calibrated frequently, ideally early in the morning before measurements begin, on each day that measurements are taken (if calibration features are available and the instruments can be calibrated by the user).

### **Timing**

The anthropometric measurements should preferably be taken in the morning before lunch, although this may not always be feasible.

### **Location**

Children should be measured in a private room and not in front of their classmates.

## **Anthropometric techniques**

### **Weight**

1. Place the scales on a perfectly flat, hard horizontal surface in such a way that the display is clearly visible. The surface of the scales should be clean. Make sure that the scale is level and adjust the position if necessary. Measurements taken with the scales on thick pile carpets or rugs are not reliable.
2. The child should only wear underwear. Ask the child to remove any heavy hair ornaments or braids.
3. Communicate with the child in a sensitive, reassuring way. Explain the weighing procedures to the child.
4. When the number 0.0 appears on the display, the scales are ready to use.
5. Ask the child to stand in the middle of the scales with his or her feet slightly apart and to remain still until the weight appears on the display. Ask the child to stand completely still until the weight is registered.
6. Record the child's body weight to the nearest 100 g (0.1 kg).

### **Height**

1. Ensure that the height board is on level ground against a wall. Make sure that the board is stable.
2. Check that shoes, socks, hair ornaments and braids have been removed. The child should wear normal, light, indoor clothing.
3. Communicate with the child in a sensitive, reassuring way. Explain the height-measuring procedure to the child.
4. Height is measured with the child standing upright. Help the child to stand on the baseboard with his or her feet slightly apart and against the vertical backboard. Make sure that the child's shoulders are level and his or her hands at the sides. The back of the head, shoulder blades, buttocks, calves and heels should all touch the vertical backboard. The legs should be straight and the feet flat.
5. Position the child's head so that a horizontal line from the ear canal to the lower border of the eye socket runs parallel to the baseboard. To keep the child's head in this position, hold her or his chin in the bridge between your thumb and forefinger.
6. Ask the child to look straight ahead.
7. If necessary, push gently on the child's stomach to help him or her stand to full height.
8. Keeping the head in position, pull the headboard down with your other hand so that it rests firmly on the top of the head and compresses the hair.

9. Read the measurement, and record the child's height in centimetres to the last completed millimetre (0.1 cm). This is the last line you can actually see. For example, if the height is between 145.7 and 145.8 cm, the figure 145.7 cm is recorded.

### **Waist circumference**

A non-elastic tape with a blank lead-in should be used for measuring waist circumference.

Waist circumference should be measured in centimetres and recorded to the last completed millimetre (0.1 cm).

#### ***Procedure***

1. The child should only wear underwear.
2. Communicate with the child in a sensitive, reassuring way. Explain the waist-circumference measurement procedure to the child.
3. Ask the child whether she or he agrees to lower his or her trousers and underclothing slightly.
4. Ask the child to stand straight with the abdomen relaxed, arms at the sides and feet pointing forwards and together.
5. To define the level at which the waist circumference is measured, palpate the hip area to locate the right ilium. Draw a horizontal line with a marker pen just above the uppermost lateral border of the right ilium (iliac crest) on the skin surface.
6. Feel for the subject's lower rib margin, and make a mark at the exact level of the lowest rib margin.
7. Measure the distance between the two marks (rib cage and iliac crest), and make a distinct mark between them. Ensure that this mark is easily distinguished from the other two.
8. Facing the child, place the tape around the trunk in a horizontal plane at the level marked on the right side of the trunk. A mirror on the wall or an assistant may be used to ensure correct horizontal alignment of the measuring tape.
9. The measurement should be taken at the end of a normal gentle expiration; the tape must not compress the skin. Waist circumference is measured in centimetres to the last completed millimetre (0.1 cm). This is the last line you can actually see. For example, if the waist circumference is between 40.5 and 40.6 cm, the figure 40.5 cm is recorded.

### **Hip circumference**

A non-elastic tape with a blank lead-in should be used for measuring hip circumference.

Hip circumference should be measured in centimetres and recorded to the last completed millimetre (0.1 cm).

#### ***Procedure***

1. The child should only wear underwear.
2. Communicate with the child in a sensitive, reassuring way. Explain the hip-circumference measurement procedure to the child.
3. Ask the child whether she or he agrees to lower his or her trousers and underclothing slightly.
4. Ask the child to stand straight with the abdomen relaxed, the arms at the sides and the feet pointing forwards and together.
5. Take the measurement at the point of maximum circumference over the buttocks. As for waist circumference, the tape should sit horizontally around the body.
6. The measurement should be taken at the end of a normal gentle expiration; the tape must not compress the skin. Hip circumference is measured in centimetres to the last completed millimetre (0.1 cm). This

is the last line you can actually see. For example, if the hip circumference is between 53.1 and 53.2 cm, the figure 53.1 cm is recorded.

### 3. Guidance for completing the school record form

The school record form is given on paper and should be completed at school at the time when the measurements are taken. Ask the school principal, head teacher, class teacher or another teacher or employee to complete the form. The school representative should have sufficient knowledge of the number of physical education lessons, physical activity opportunities, health-promoting activities, and the availability of foods and drinks on school premises.

The examiner should tell the school representative that if they have any questions about the form, they are welcome to ask for help. They can also consult their colleagues.

#### SCHOOL CODE

Before handing in the school record form, the examiner must enter the school code in the top right corner of the form.

The school code is comprised of nine characters, for example: EST160145.

The school code consists of the following parts:

**Country code.** Consists of three letters: **EST**

**Year.** The last two digits of the data collection year: **16**

**School code.** Each participating school is given a four-digit code. If the school code is 1, **0001** should be entered in the form, if the code is 10 or 100, **0010** and **0100** should be entered, respectively.

NB! The same code is also given in the children's dataset of the corresponding school.

#### INFORMATION ON PARTICIPATING CLASSES

Question 3 must be answered by the examiner. The data on each class should be entered on a separate row.

**Class code.** The class code consists of two characters, for example: **11**.

The first number stands for the grade number. The grade number of a first-grade pupil is **1**.

Only first-grade pupils are measured in 2016, so any other number cannot be entered.

The second number stands for the parallel class number. Parallel first-grade classes should be indicated with numbers starting from 1. Even if these classes are normally indicated with letters (e.g. A), in this study, the first parallel class should be indicated with **1**, the second parallel class with the number **2**, etc. If there is only one first-grade class, it should be indicated with the number **1**.

**Number of pupils registered.** The numbers of girls and boys registered in each participating class in the school.

**Number of pupils examined (measured).** The number of girls and boys in each participating class for whom anthropometric measurements such as weight and height were taken.

**Number of pupils absent.** The numbers of girls and boys in each participating class who were absent on the day of measurements. If none of the registered pupils in a class were absent and all children could be measured, enter 0 for girls and 0 for boys.

**Pupils who refused.** The numbers of girls and boys in each participating class who refused to be examined (measured).

**Parents who refused consent.** The numbers of girls and boys in each participating class whose parents did not give consent for them to be examined (measured)



# APPENDIX 2. CHILD'S RECORD FORM

## (1) CHILD'S IDENTIFICATION CODE

### (2) Child's sex

- 1 - Boy
- 2 - Girl

### (3) Child's date of birth

### (4) Child's place of residence

- 1 - Town
- 2 - Borough
- 3 - Small borough
- 4 - Village

## ANTHROPOMETRIC EXAMINATION

### (5) Date of measurement

### (6) Time of measurement

- 1 - Before school lunch
- 2 - After school lunch

### (7) Child's assent

- 1 - Yes, child agrees to be measured
- 2 - No, child does not agree to be measured
- 3 - Child is absent
- 4 - Parent did not give consent for their child to be measured

### (7a) Why does the child refuse to be measured?

- 1 - Child is not feeling well or is in pain
  - 2 - Child is anxious/nervous
  - 3 - Child has a physical disability
  - 4 - Other reason
- Please specify.....

### (8) Did you have breakfast this morning (except just water, milk or juice)?

- 1 - Yes
- 2 - No



## Measurements

**(9) Weight (kg)**

**(10) Height (cm)**

**(10a) Second height measurement (cm)**

**(11) Waist circumference (cm)**

**(11a) Second waist circumference (cm)**

**(12) Hip circumference (cm)**

**(12a) Second hip circumference (cm)**

**(13) Describe the clothes the child is wearing when measured.**

- 1 - Underwear only
- 2 - Gym clothes (e.g. shorts and t-shirt only)
- 3 - Light clothing (e.g. t-shirt, cotton trousers or skirt)
- 4 - Heavy clothing (e.g. sweater and jeans)
- 5 - Other

**(13a) Please specify:.....**

**(14a) How do you usually come to school in the morning?**

- 1 - Walking/cycling
- 2 - Motorised vehicle (car, public transport)
- 3 - Combination of walking/cycling and motorised vehicles

**(14b) How do you usually go home from school?**

- 1 - Walking/cycling
- 2 - Motorised vehicle (car, public transport)
- 3 - Combination of walking/cycling and motorised vehicles

**(15) Are you a member of a sports club or do you engage in extracurricular sports (e.g. football, track and field, ice hockey, swimming, tennis, basketball, gymnastics, ballet, folk dance, dancesport, etc.)?**

- 1 - Yes (continue to the next question)
- 2 - No

**(15a) On how many days a week do you usually engage in extracurricular sports activities (including weekends)?**

.... days

**(16) Examiner's name**

**OBSERVATIONS BY EXAMINER**

# APPENDIX 3. SCHOOL RECORD FORM

Country			Year		School code			

1. Name of the school .....

2. What is your function at the school?

- principal/head teacher
- teacher
- other (*please specify*).....

## INFORMATION ON PARTICIPATING CLASSES

3. For each participating class, please complete the columns below: (Please complete this question together with the examiner.)

Class code	No. of pupils registered	No. of pupils examined	No. of pupils absent	No. of pupils who themselves declined to be examined	No. of pupils whose parents did not give consent
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys
<input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys	<input type="checkbox"/> Girls <input type="checkbox"/> Boys

## INFORMATION ON THE SCHOOL ENVIRONMENT

4. Does your school have outdoor playground area(s)?

- Yes
- No

**5. Does your school have an indoor gym?**

- Yes (Continue to question 7)
- No

**6. Can the children use another nearby gym?**

- Yes
- No

**7. Does your school curriculum include physical education lessons in addition to those specified in the national curriculum?**

- Yes, for all grades
- Yes, for some grades
- No

**8. In this current school year, for how much time each week does your school provide physical education lessons (physical education, rhythmic gymnastics, swimming, folk dance) to the pupils of each class participating in this project?**

Participating class	
1A	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week
1B	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week
1C	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week
1D	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week
1E	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week
1F	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> minutes per week

**9. Are the children allowed to actively play outside during breaks? Check all appropriate answers.**

- Yes, during all breaks
- Yes, during outside breaks (playing outside is mandatory)
- Yes, during outside breaks (playing outside is voluntary)
- No

**10. Are the children allowed to use outdoor playground areas outside school hours?**

- Yes
- No

**11. Are the children allowed to use the indoor gym outside school hours?**

- Yes
- No

**12. Does your school organise any sport/physical activities at least once a week for primary school children outside school hours? Check all appropriate answers.**

- Yes, for free
- Yes, for a fee
- No

**13. In your opinion, how safe are the routes to and from school for most pupils to walk or ride a bicycle? (Please circle the appropriate number).**

<b>Extremely safe</b>	<b>Extremely unsafe</b>
1   2   3   4   5   6   7   8   9   10	

**14. Does your school curriculum include nutrition education, either given as a separate lesson or integrated into other lessons?**

- Yes, integrated into other lessons (e.g. home economics)
- Yes, as a separate lesson
- No

**15. In this current school year, have any initiatives/projects been organised (or will be) in each class participating to promote a healthy lifestyle (e.g. to promote physical activity and/or healthy eating)?**

1A	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1B	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1C	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1D	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1E	<input type="checkbox"/> Yes	<input type="checkbox"/> No
1F	<input type="checkbox"/> Yes	<input type="checkbox"/> No

### 16. Which of the following kinds of foods or beverages can pupils obtain on the school premises?

Please tick all items that apply.

<b>Beverages</b>		<b>Free</b>	<b>For a fee</b>	<b>Not available</b>
Without added sugar	Water	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Tea	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	100% fruit juices with no added sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
With added sugar	Fruit juices or other non-carbonated drinks containing added sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Carbonated (soft) drinks containing added sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Flavoured milk or yoghurt with added sugar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Hot drinks (cocoa, tea, latte)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dairy	Milk, yoghurt, kefir	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other drinks with non-sugar sweeteners	Soft drinks (including fruit juice drinks and flavoured milks)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Energy drinks		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sports drinks		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other (please specify)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<b>Foods</b>		<b>Free</b>	<b>For a fee</b>	<b>Not available</b>
Fresh fruits		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vegetables		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Dried fruits, nuts		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sandwiches		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Salads		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sweet snacks (e.g. chocolate, sugar confectionery, cakes, breakfast and/or cereal bars, sweet biscuits and/or pastries)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ice cream		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Savoury snacks (e.g. potato crisps, salted popcorn, salted nuts, savoury biscuits and/or pretzels)		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**17. Does your school have a shop or cafeteria where foods or beverages can be purchased?**

Yes

No

**18. Does your school have vending machines where children are allowed to purchase foods or beverages (other than water, fruits and vegetables)?**

Yes

No

**19. Do you provide a hot breakfast for your pupils?**

Yes

No

**20. Do you provide an afterschool meal for all children?**

Yes

No

**21. Does your school advertise and market (e.g. posters, billboards or banners with food company names or products featured, food company imagery or names on vending machines, and/or branded school materials such as books, sports equipment) any energy-dense and nutrient-poor foods (e.g. cakes, pastries, sweets) and beverages that could undermine the promotion of a healthy, balanced diet?**

Yes

No

Signature

Date \_\_\_\_\_

**REMARKS**

**THANK YOU VERY MUCH FOR COMPLETING THIS QUESTIONNAIRE!**



