CO-CREATE

D 3.2: Time trends and differences in overweight and obesity (COSI data)

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Executive SummaryPrevalence of overweight and obesity in European children is high, particular in southern Europe. Data from the children in the WHO COSI stdy shows that there is an association between socio-economic status (SES) and prevalence of overweight and obesity is characterized by heterogeneity, but generally, children of families with low SES are more likely to be overweight than children with high SES. Socio-economic differences in weight status might have increased during the last decade.

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List of acronyms / abbreviations

BUL - Bulgaria

COSI - The Childhood Obesity Surveillance Initiative

IRE – Irleand

ITA – Italy

LIT – Lithauania

MAT – Malta

POR - Portugal

SES – Socio-economic status

SMR – San Marino

SPA – Spain

TUR - Turkey

Introduction

Deliverable description

This deliverable describes time trends and differences in overweight and obesity rates by socio-economic status based on data from the WHO Childhood Obesity Surveillance Study among 6-9 years olds in European countries. With Co-Create, the purpose of the analysis is to demonstrate cross-country variations in overweight and obesity prevalence data. These data are relevant for the planned analysis of the associations between national policies and national prevalence data.

Background

Since 1980, the global prevalence of obesity has doubled in more than 70 countries and has continuously increased in most other countries (1). Although the prevalence of obesity among children has been lower than that among adults, the rate of increase in childhood obesity in many countries has been greater than the rate of increase in adult obesity.

The WHO Childhood Obesity Surveillance Initiative (COSI) is a European system to routinely measure the body weight and body height of primary-school children aged 6-9 years. COSI provides nationally representative and highly standardized data on childhood obesity prevalence in European countries. Data have been conducted in five survey waves in the time period 2007-2017 and permits monitoring European children's BMI over time. The number of countries that has collected data has increased over time from 12 in the first round (2007/08) to 36 in the fourth round (2015/17).

Methods

In the COSI-study, classification of children's weight status is based on the 2007 WHO recommended growth reference for school-aged children and adolescents (2). The WHO 2007 cut-offs were used to compute BMI-for-age (BMI/A) Z-scores and to estimate prevalence of overweight and obesity. According to WHO definitions, overweight, obesity and severe obesity are defined as a BMI-for-age value > +1 Z-score, > +2 Z-scores and > +3 Z-scores, respectively. The estimated prevalence of overweight includes children with obesity. Children with biologically implausible (or extreme) values were excluded from the analysis: BMI/A values below –5 or above +5 Z-scores relative to the 2007 WHO growth reference median.

Family socio-economic status (SES) is assessed through self reported paretnal educational levels which in this report was dichotomised as follows: 1) both parents with low educational level (= low SES); 2) at least one parent with high educational level (= high SES). Low educational level was defined by grouping together the following answer options: "primary school or less", "secondary or

high school" and "vocational school". High educational level included "undergraduate or bachelor degree" and "master degree or higher".Pearson design-based χ2 test was used for assessing homogeneity of prevalence estimates across rounds of data collection. Low SES and high SES groups were analysed separately .

Results

Prevalence of overweight and obesity in children age 6-9 years

Prevalence of overweight and obesity varied across the European countries. In general, prevalence of overweight or obesity was higher in the macro-region Southern Europe, followed by Eastern Europe and North-Western Europe, while the corresponding prevalence rates observed in Central Asian countries were lower (figure 1, see also definitions of the regions as a footnote). The highest level of overweight and obesity was observed in Cyprus, in which 43 % of boys and girls were overweight (including obesity) and 21.5% of boys and 19.2% of girls were obese. The lowest level of overweight (including obesity) was observed in Tajikistan, in which 9.4% of boys and 5.2% of girls were overweight, and 1.8% and 1.1%, respectively, were obese. In North Macedonia and in Malta more than 7% of boys have severe obesity (see definition above), while the prevalence was less than 1% in Central Asia.

Figure 1. Prevalence values (%) of thinness, overweight (including obesity), obesity (including severe obesity) and severe obesity among 7-9-year-old boys and girls by macro-region*. COSI Round 4 (2015-2017) (Unpublished data, submitted to Obesity Facts April 2020)
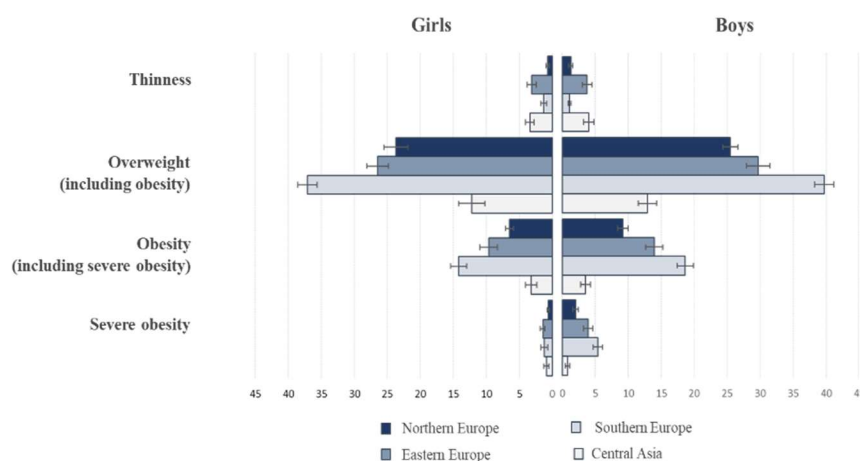
 *Macro-regions are defined according to United Nations "Standard Country or Area Codes for Statistical Use" and include the following countries-age groups: i) 7-year-olds in Bulgaria, Czech Republic, Denmark, Estonia, Finland, Greece, Hungary, Kyrgyzstan, Ireland, Lithuania, Latvia, Malta, Montenegro, Portugal, North Macedonia, Serbia, Spain, Slovakia, Slovenia, Tajikistan and Turkmenistan; ii) 8-year-olds in Albania, Austria, Croatia, France, Italy, Norway, Poland, Romania, San Marino and Sweden and iii) 9-year-olds in Kazakhstan. Estimates for Western Europe and Western Asia were not calculated because only few countries belonging to these two macro-regions participated in COSI.

Socio-economic status and prevalence of overweight and obesity

Analysis of SES differences in weight status were performed for COSI countries in which parental SES were included in two or more survey rounds. As shown in figure 2 (boys) and 3 (girls), the association between parental educational level (high versus low SES) and children's prevalence of overweight and obesity was characterized by heterogeneity. SES differences in overweight prevalence were found in 2 out of 4 countries in 2007/08, and in 7 out of 10 countries in 2015/17.

Positive as well as negative associations were observed between parental SES and children's weight status. Higher prevalence ($p < 0.05$) of overweight and obesity in children with low SES, compared to children with high SES in Ireland in 2012/13 (boys), in the Czech Republic in 2009/10 (girls), 2012/13 and 2015/17, in Italy in 2019/10, 2012/13 and 2015/17, in Spain in 2009/10 and 2015/17, in Turkey 2012/13 and in Malta, Portugal and San Marino and in 2015/17. The opposite pattern; higher overweight rates in children with high SES compared to children with low SES, were seen in Lithuania in 2007/08 (boys), Bulgaria in 2007/08 (girls) and in 2012/13 (boys) and in Turkey 2015/17.

In most countries, no significant changes in prevalence of overweight and obesity was observed across survey rounds. However, in Portugal, prevalence of overweight decreased in both low and high SES groups in boys, but not in girls. In Italy, prevalence of overweight and obesity decreased in all groups except boys with high SES. By contrast, increased prevalence of overweight and obesity was seen in low SES Lithuanian boys as well as in high SES Turkish boys and girls.

Figure 2. Prevalence of overweight and obesity in 7 year old boys by parents' educational attainment, round of data collection and country
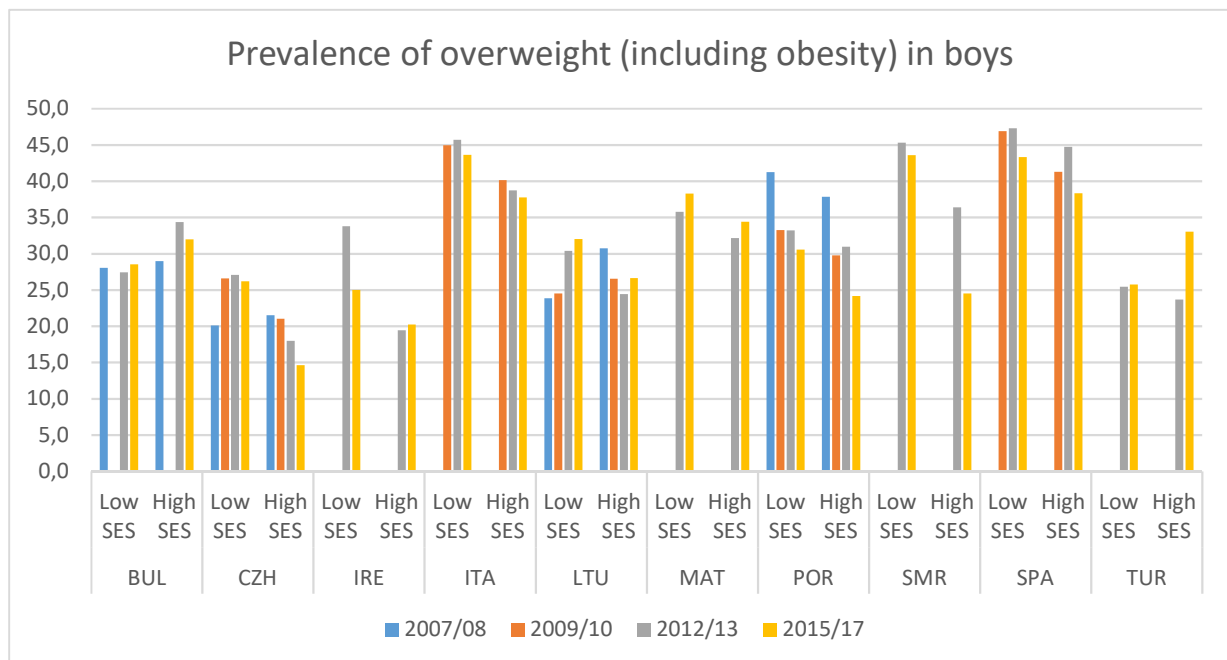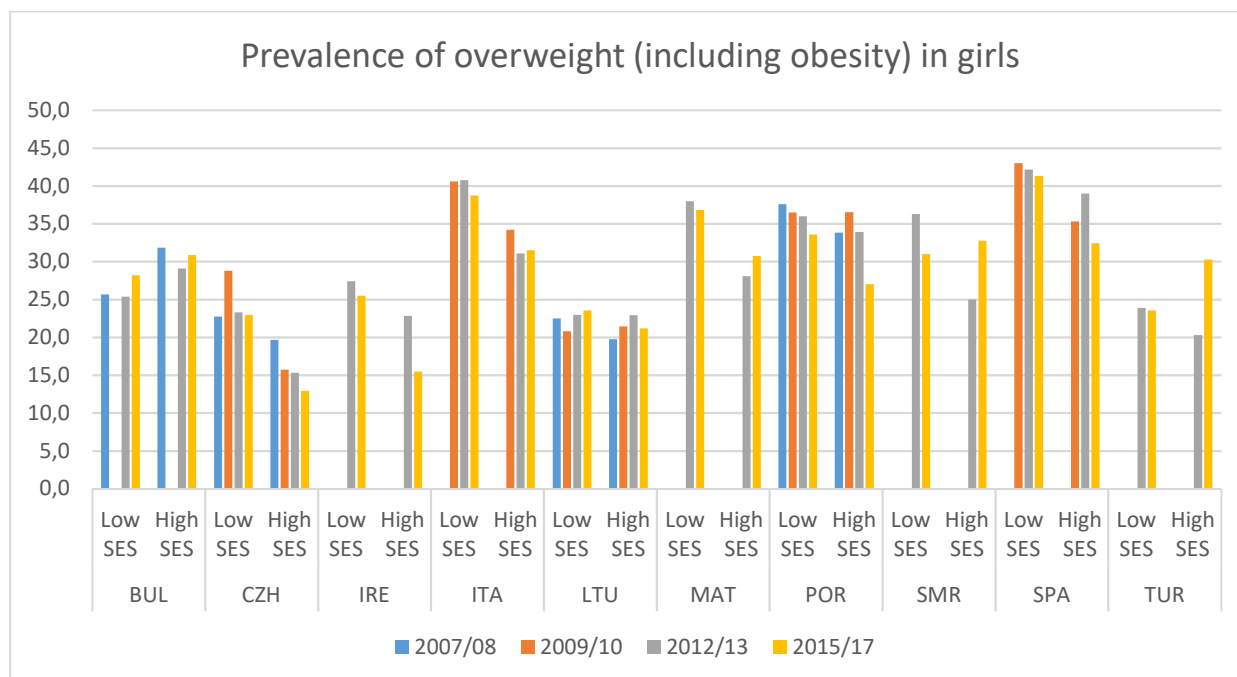
Figure 3. Prevalence of overweight and obesity in 7 year old girls by parents' educational attainment, round of data collection and country

Despite sustained efforts to tackle childhood overweight and obesity in the European region, the results from COSI surveys presented in this report show that the prevalence of overweight and obese children is high, particular in Southern Europe. The association between SES and weight status is characterized by heterogeneity, but generally, children of families with at least one parent having higher education are less likely to be overweight, particularly in survey year 2015/17. The presented estimates should be viewed in light of great cross-country variation in number of included children and in the distribution of high versus low parental educational level, and the use of only one SES indicator. It should be noted, however, that during the years of observation, significant associations between SES and overweight were demonstrated in several countries. This might indicate that socio-economic differences in childhood overweight have increased during the last decade.

Conclusion

Findings from the COSI study indicate that ongoing health promotion efforts aimed at reducing overweight and obesity across all SES groups have not adequately succeeded. When aiming to understand the mechanisms behind socio-economic differences in the risk factors of childhood overweight and obesity, attention should be devoted to the demonstration of heterogenity in the association between SES and children's weight status. Trends and differences in childhood overweight and obesity prevalence should be viewed in light of vaiation in implemented national policy iniatives. The indication of increased socio-economic differences should be followed closely.

Importantly, COSI surveys provide the opportunity to describe further trends in children's BMI and their associations with SES. Results from the most recent survey round (2018/19) will be included in upcoming CO-CREATE reports.

Cross-country differences in policies might be viewed in light of variation in implemented policies, which are briefly discussed in a recent CO-CREATE policy brief. Further analysis and linkage to a CO-CREATE policy index report are in process and will be submitted October 2020.

References

1.GBD 2015 Obesity Collaborators, Afshin A, Forouzanfar MH, et al. Health Effects of Overweight and Obesity in 195 Countries over 25 Years. *N Engl J Med*. 2017;377(1):13-27. doi:10.1056/NEJMoa1614362

2. de Onis M, Onyango AW, Borghi E, Siyam A, Nishida C, Siekmann J. Development of a WHO growth reference for school-aged children and adolescents. *Bull World Health Organ*. 2007;85(9):660-667. doi:10.2471/blt.07.043497

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