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## D 3.6: Time-related changes in overweight, obesity and EBRB in relation to changes in national diet and physical activity policies

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## Executive Summary

The Co-Create project aims to explore and develop an index for summarising national policies and explore the associations with adolescents' energy balance related behaviours. In this report, we focus adolescents' consumption of sugary soft drinks and related policies.

Data from the Health Behaviour in School-age Children study report cross-national variation in trends in overweight and obesity rates. When looking at the countries participating in the CO-CREATE project in particular, prevalence of overweight and obesity (combined) among adolescents increased in Norway, Poland and Portugal during 2002 – 2018, while quite stable trends were observed in England and the Netherlands.

Trends of decline in the prevalence of daily consumption of sugary soft drinks were observed in all countries. The extent to which policy actions were implemented in the respective countries varied greatly. However, policy scans and uploads to the NOURISHING database are not yet completed. Thus, evaluation of trends and soft drink consumption in the context of identified national policy actions should be considered in light of this limitation.

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## Background

The Co-Create project aims to explore and develop an index for summarising national policies and explore the associations with adolescents' energy balance related behaviours. In this report, we focus on adolescents' consumption of sugary soft drinks and related policies.

Rapid increase in prevalence of overweight and obesity is seen in many parts of the world in recent decades. Overweight and obesity during childhood and adolescence are linked to current and future health problems (1), school absence and social isolation (2,3). Reducing overweight and obesity rates in the younger population is therefore a key public health concern. The primary causes of overweight and obesity can be traced to energy balance related behaviours (EBRB) – physical activity, sedentary behaviour, eating behaviour and sleep – which contribute to an energy imbalance between calorie intake and energy expenditure. Concerning the particular relevance of eating behaviours, intake of sugar added soft drinks are considered a key target when aiming to reduce overweight and obesity. A systematic review (4) suggests that sugary soft drink consumption is positively associated with obesity indices in children and adults and conclude that public health policies should aim to reduce the consumption of sugary soft drinks and encourage healthy alternatives.

In most European countries, the prevalence of soft drink consumption among adolescents is high. Data from the Health Behaviour in School-aged Children survey (HBSC) reported that in 2018, 16 % of European adolescents consumed sugary soft drinks on a daily basis (5). Prevalence varied greatly by country, age, gender and socio-economic status. In many countries, great effort has been devoted to policy actions aiming to reduce overweight and obesity through initiatives targeting young people's sugar intake. Fiscal measures, such as tax on sugar sweetened beverages, school food policies that define standards for foods available to children and adolescents, marketing restrictions and clear targets for the food industry to improve the nutritional quality of food, are considered important policy actions when targeting soft drink consumption (6). The context of national policy actions might contribute to the understanding of national prevalence and cross-country variation in soft drink consumption in the younger population.

This report highlights trends in weight status and sugary soft drink consumption in the current CO-CREATE countries (The Netherlands, Norway, Poland, Portugal and the United Kingdom), with a particular focus on how trends developed in the context of national nutrition policy actions. Prevalence and trends (HBSC data) of EBRBs such as the intake of fruit and vegetables, and physical activity are reported in deliverable D 3.3 and therefore not included in this report.

### Deliverable description

The deliverable 3.6 is described as the "First report on observed time-related changes in overweight, obesity and EBRB in relation to changes in national diet and physical activity policies" in the Grant Agreement and is the result of task 3.3. This is based on the most recent available data from the WHO initiated HBSC study from 2017/2018 which reports time trends and cross-national differences in EBRB, overweight and obesity rates. In this report, EBRB is limited to soft drink consumption and identified policy actions aiming to reduce young people's intake of such beverages.

As part of the CO-CREATE project, Work Package (WP) 2, is currently in the process of populating the NOURISHING and MOVING databases (7) and updating and identifying information concerning national policy actions in the European countries. However, as this work is still ongoing and not yet completed, this report provides information based on the NOURISHING database, and with a particular focus on policy actions to reduce consumption of soft drinks. This will be the first of two reports based on data from HBSC and NOURISHING/MOVING databases. CO-CREATE (WP 2 and WP 3) aim to provide a comprehensive overview of time-related changes in overweight, obesity and

EBRB in relation to changes in national diet and physical activity policies, including policy index based on NOURISHING and MOVING in CO-CREATE deliverable D.3.7.

## Objective of deliverable

The main objective of this report is to provide information about time trends and differences in prevalence of overweight and obesity, and sugary soft drink consumption among adolescents age 15 year old, from the Netherlands, Norway, Poland, Portugal and UK, and to evaluate these trends in the context of implemented policy actions in the respective countries.

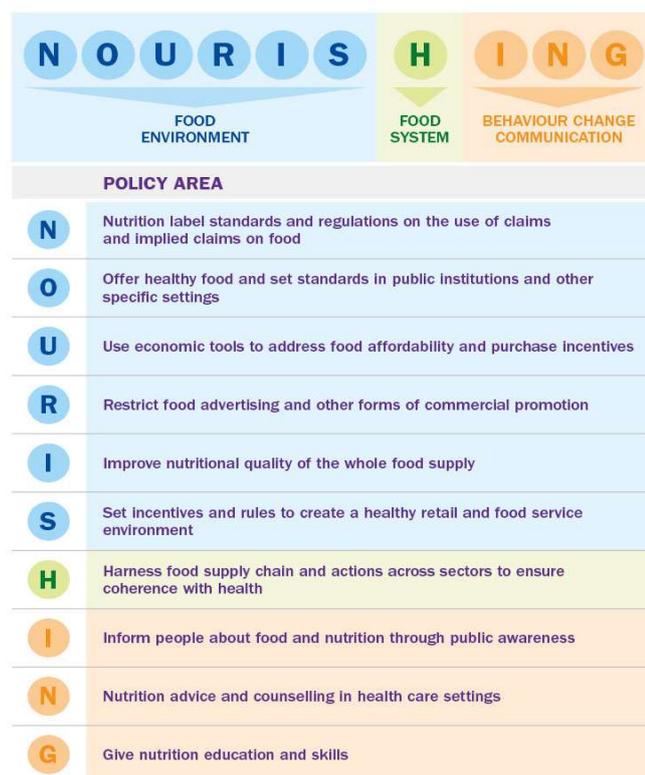
## Methods

### The Health Behaviour in School-aged Children study

The HBSC survey (8) conducts self-reported data from national samples of adolescents age 11, 13 and 15 year olds every fourth year, in an increasing number of countries. The HBSC study is conducted under the auspices of WHO Euro who has extensive experience in analysing HBSC body weight related measures and EBRB data across time countries, gender and socio-economic groups. For the five CO-CREATE countries highlighted in this report, valid trend data on overweight, obesity and soft drink consumption were available from survey year 2002. Data from adolescents age 15 are reported, and England was used as a proxy for UK.

### NOURISHING DATABASE

The World Cancer Research Fund's (WCRF) international NOURISHING database ([www.policydatabase.wcrf.org](http://www.policydatabase.wcrf.org)) provides an overview of implemented national government policy actions that promote healthy diets and reduce obesity from around the world. NOURISHING has been redesigned as part of the CO-CREATE project. As part of CO-CREATE, WCRF is conducting in-depth systematic search across European countries, known as the Comprehensive European Scan. This scan is currently ongoing and the database are getting updated in a rolling basis as countries are included as policy actions are identified and verified. Similarly, the database MOVING provides an overview of implemented government policy actions that promote physical activity. For the current report, we provide information concerning policy actions identified in the NOURISHING database from the five countries participating in the CO-CREATE project: Netherlands, Norway, Poland, Portugal and UK. However as the Comprehensive Scan is still ongoing, it is important to note that not all relevant policies may be listed on the database at this time<sup>1</sup>.



<sup>1</sup> NB At the time of writing, the status of the Comprehensive European Scan is as follows: Netherlands - scan underway, Norway - complete and uploaded, Portugal - scan complete - awaiting verification and uploading, Poland - scan underway, UK - complete and uploaded (apart from last few policies)

To identify policy actions relevant for the current report, the search terms “sugar” “sugary drinks” were used to identify policy actions addressing soft drink consumption. Additionally, an overview of total numbers of policy actions addressing healthy food habits is provided

## Results

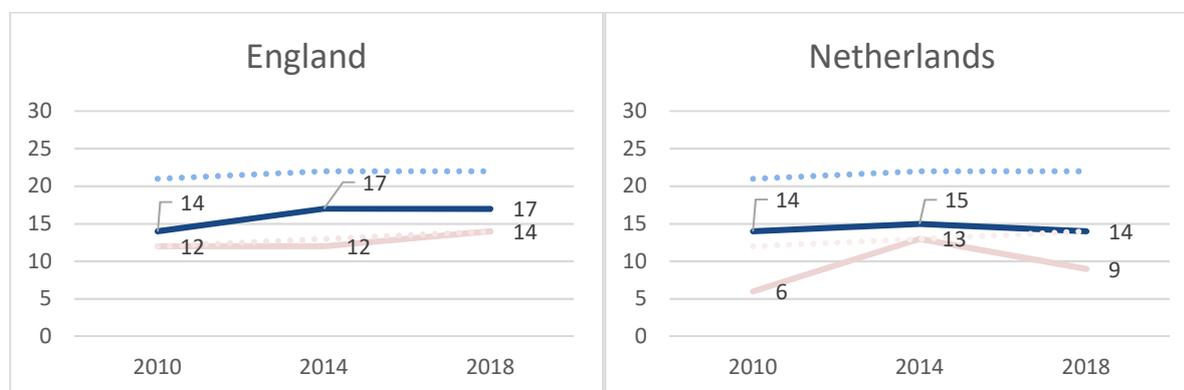
### Trends in prevalence of overweight and obesity among adolescents

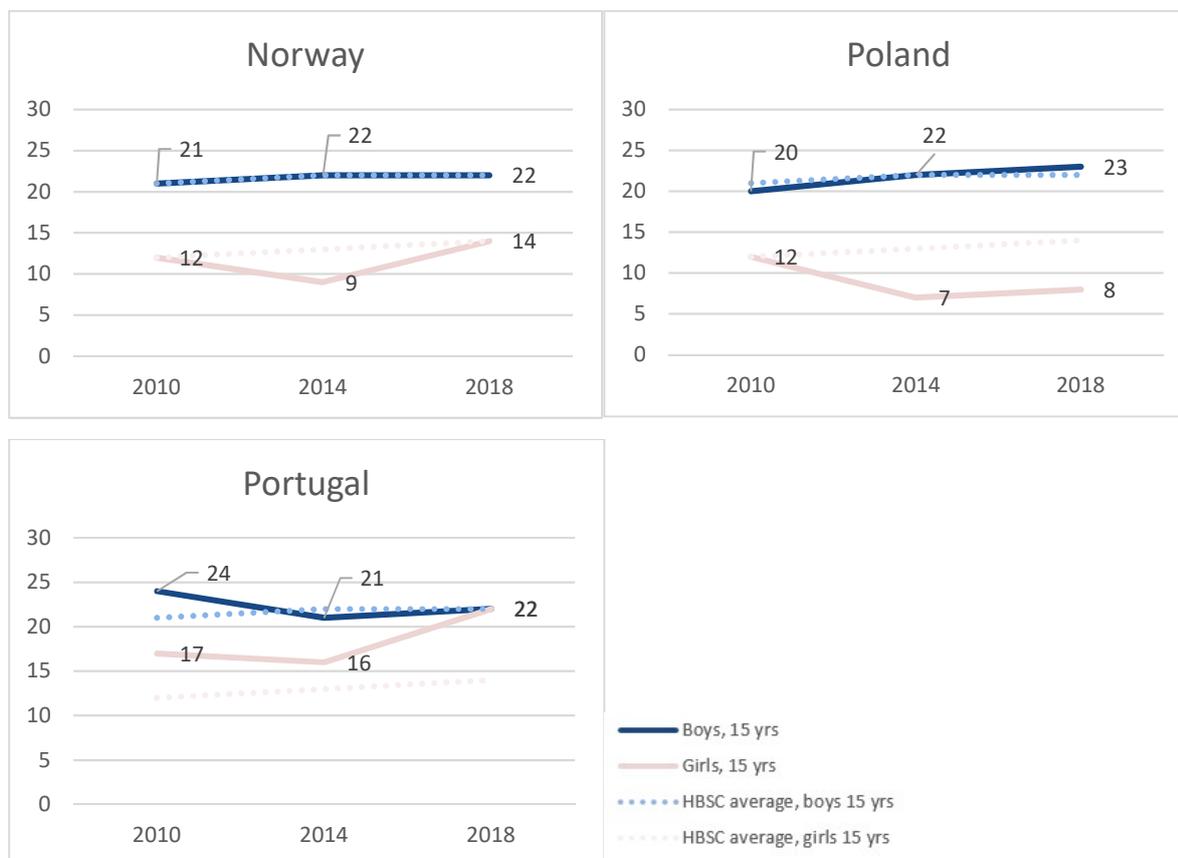
Only small changes in prevalence of overweight and obesity were observed across the years of observation. In survey year 2018, the highest proportion of overweight or obesity were seen among Polish boys (23%) and Portuguese girls (22%). There were variations in gender differences in the respective countries. While increasing gender differences were shown in Poland (boys 23% vs girls 8%), gender differences were no longer present in the Portuguese sample in survey year 2018.

Prevalence of obesity increased in Poland (significant in boys), Norway (not significant) and Portugal (not significant) during 2002 – 2014 (6). In the Netherlands, obesity rates decreased among boys (not significant) and increased among girls (not significant). In the total HBSC sample, the lowest levels of obesity were found in the Netherlands and Norway. Data from the most recent HBSC survey showed a tendency of increased prevalence of overweight and obesity from 2014 to 2018 among girls in Norway and Portugal, decreased prevalence among girls in Netherlands, and stable trends in Poland and England.

Trends in proportions overweight and obesity (combined) during the time period 2010 to 2018 are presented in figure 1.

Figure 1. Proportions of 15 year old youth living with overweight or obesity (combined) in selected European countries (Co-CREATE) based on self-reported height and weight in the HBSC-study, 2010-2018.



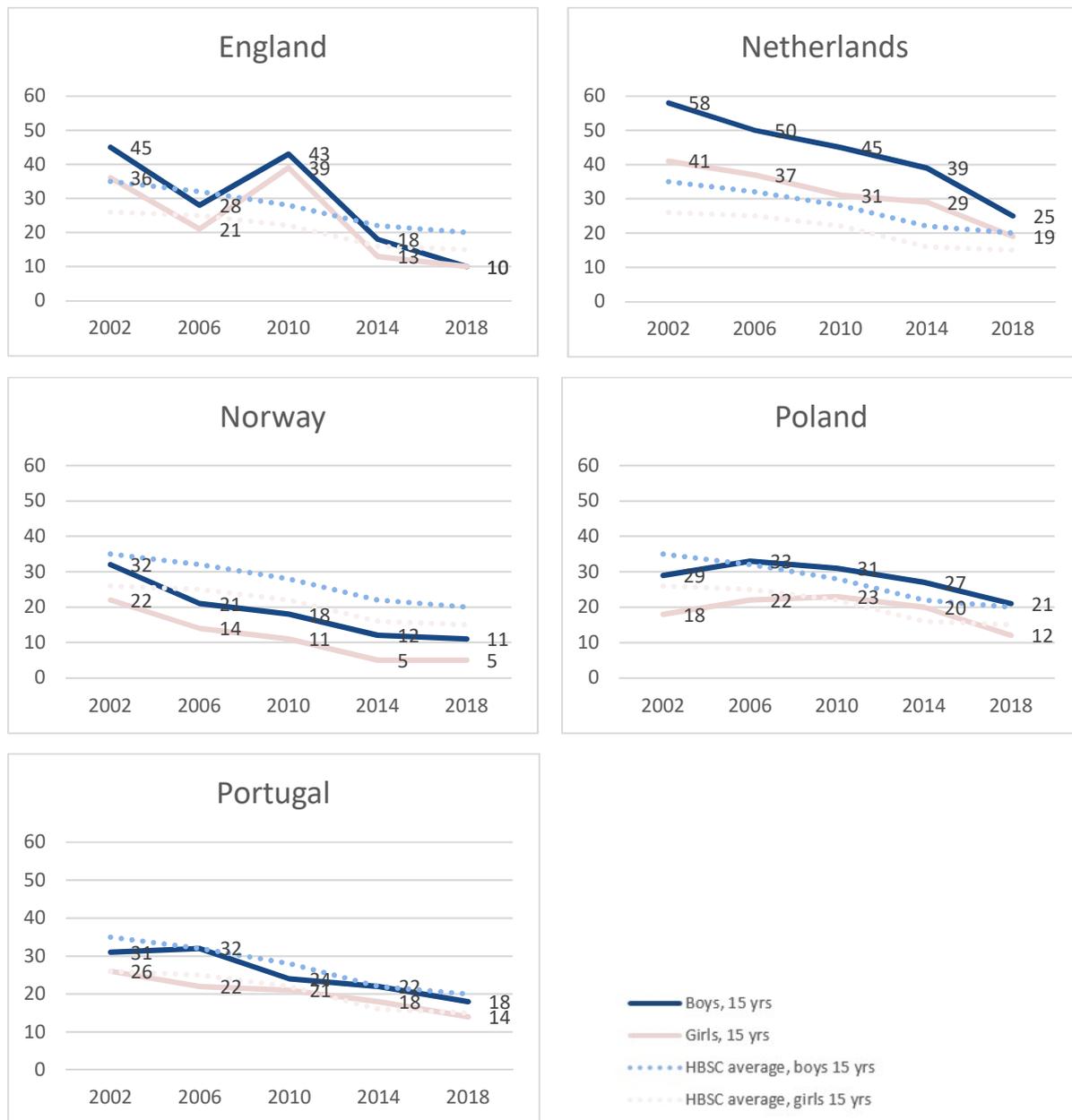


### Trends in prevalence of adolescent's sugary soft drink consumption

Daily consumption of sugary soft drinks declined between 2002 and 2018 in all countries examined in this report. However, the sizes of decline were heterogeneous across the five countries. The greatest decrease, measured by both absolute and relative decline, was seen in England and the Netherlands. A different pattern was seen in Poland, in which slightly increase in the proportion reporting daily soft drink consumption were seen during the first survey years, followed by decrease during the most recent survey years. Despite this encouraging trends of decreased soft drinks consumption in all countries studied, the prevalence of daily consumers is high, particularly among boys in the Netherlands, Portugal and Poland, in which one in four reported daily consumption of sugar added soft drinks. As shown in the HBSC report (5), the results reflect the general findings of higher soft drink consumption in western European countries compared to Southern and Northern European countries. In the Netherlands, increased social inequalities in soft drinks consumption was observed in the time period 2002 – 2018. Trends in proportions of adolescents reporting daily consumption of soft drinks are shown in figure 2.



Figure 2. Daily intake of sugar sweetened beverages among 15 years old in selected European countries (Co-Create) based on self-reports in the HBSC-study, 2002-2018.



## Policy actions targeting healthy food habits

Great cross-country variation was recognized in total numbers of national policy actions registered in the NOURISHING database. The highest number of registered policy actions was identified in UK (31), followed by Norway (24), Portugal (12), The Netherlands (9) and Poland (8). All countries had one or more policy actions addressing nutrition label standards and regulation on the use of claims and implied claims on food (N), healthy food and set standards in public institutions and other specific settings (O) and nutritional quality of whole food supply (I).

Policy initiatives addressing behaviour change communication were to a greater extent observed in UK and Norway compared to the other countries. Table 1 show variation in numbers of implemented national policy actions identified in the NOURISHING database.

Table 1. Number of national policy actions registered in the NOURISHING database [October 26<sup>th</sup> 2020]

		The Netherlands	Norway	Poland	Portugal	United Kingdom
<b>Food environment</b>	<b>N</b>	4	4	4	3	5
	<b>O</b>	1	3	2	2	3
	<b>U</b>	-	2	-	1	2
	<b>R</b>	-	3	1	4	4
	<b>I</b>	2	2	1	1	3
	<b>S</b>	-	1	-	-	2
<b>Food system</b>	<b>H</b>	-	-	-	-	3
	<b>I</b>	2	4	-	1	5
<b>Behaviour change communication</b>	<b>N</b>	-	3	-	-	3
	<b>G</b>	-	3	-	-	3
	<b>Total</b>	9	24	8	12	31

## Policy actions targeting soft drink consumption in particular

Cross-country variation was seen when searching NOURISHING database for national policy actions targeting soft drinks. The following policy actions were identified in the NOURISHING database.

### Norway:

**National Guideline for food and meals in schools:** published in 2015 (revised guidelines from 2003), recommends schools to completely exclude sweetened beverages during the school day.

**Excise duty on chocolate and sugar products & non-alcoholic beverages:** Norway introduced taxes on non-alcoholic beverages as luxury items in 1924. In 2017, beverages are taxed at 3.34 Norwegian Kroner (NOK) (around \$0.40).

**The Saturday All Week Campaign.** The campaign (launched in 2017) focused on the main sources of added sugar: soft drinks, sweets and cakes. The campaign was carried out in collaboration with actors such as the Football Association and the Football National Team, as well as preventive health services such as health stations, schools, the dental health service and Healthy Life Centres (HLC; Frisklivssentraler).

**Små grep, stor forskjell.** Sugar reduction communication was also included in the campaign associated with the national food guidelines “Small changes, big difference”, as well as part of the Norwegian Directorate of Health's Always On strategy.

**The Sugar School.** A training programme called “The Sugar School” aimed at health professionals in community health centres and school health services. This programme supports health professionals to communicate to children and young people about limiting sugar consumption.

### Netherlands

Concerning the Netherlands, 9 policy actions targeting healthy food habits. However, no policy actions targeting soft drink consumption in particular were detected when searching the NOURISHING database. However it is important to note that the Comprehensive Scan for the Netherlands is underway at the time of writing, so this may change.

### Poland

**The Amended Act on Food and Nutrition Safety:** In 2006 (revised in 2014), nutrition standards for food and beverages intended for sale:  $\leq 10\text{g sugar}/100\text{g/ml}$  was implemented in canteens in all primary and secondary schools.

### Portugal

**Ministerial Order on the sale of unhealthy food and drink products at health institutions (2017).** Portuguese government bans the sale of a sugary soft drinks as well as a variety of other unhealthy food and drink products at Ministry of Health and National Health Service institutions

**The Special Consumption Tax.** Non-alcoholic beverages with a sugar content of less than 80g per litre are charged at €0.08 per litre (around \$0.10); or €0.16 per litre (around \$0.20) when the sugar content exceeds 80g per litre. The tax covers mineral, flavoured and aerated waters that contain added sugar or other sweeteners.

**Law amending the Portuguese Advertising Code (2019)** Restrictions on advertising directed to children under 16 years of food and beverages that contain high energy content, salt, sugar, and fats.

### United Kingdom

**Standards and guidelines for hospital vending machines – Wales (2008).** Vending machines sugary drinks are prohibited in National Health Service hospitals in Wales. Scottish government issued

guidelines (2008) to removal of all soft drinks with a sugar content >0.5g per 100ml from vending machines (unsweetened fruit and vegetable juices are exempt). The 2012 update of the guidelines relaxed this requirement to 70% of drinks having to comply with the sugar limit of 0.5g per 100ml (but some hospital boards choose to retain the complete removal of sugary drinks), and mandated that vending machines must contain prominently positioned water, unsweetened fruit juice and/or low-fat milk.

**The Soft Drinks Industry Levy (2018).** The Soft Drink Industry Levy applies to any pre-packaged soft drink with added sugar, containing at least 5g of total sugars per 100mL of prepared drink. Soft drinks that have a total sugar content of more than 5g and less than 8g per 100mL are taxed 0.18 British pounds (\$0.25) per litre and drinks that have a total sugar content of 8g or more per 100mL are taxed 0.24 British pounds (\$0.34) per litre. The levy applies to soft drinks produced and packaged in the UK and soft drinks imported into the UK.

**Voluntary sugar tax.** Brighton & Hove City Council actively encourages food outlets to adopt a voluntary £0.10 levy (around \$0.15) on all non-alcoholic sugar-sweetened drinks sold.

**Advertising ban on unhealthy food in London's public transport network (2019).** The policy specifies that food and non-alcoholic drinks high in fat, salt and sugar (according to the UK Nutrient Profiling Model, are not permitted to be advertised on TfL-controlled buses, underground and overground train networks, taxis, river services, trams and other transport systems.

**The Sugar Reduction Programme (2018).** Guidelines for every sector of the drinks industry to reduce the overall sugar content of juice based drinks by 5% and milk based drinks by 20% by 2021, with an interim ambition for milk based drinks of a 10% reduction by 2019.

**#SugarSmartCity** – Brighton & Hove (2015-). Through a dedicated webpage, social media and events, the campaign aims to raise awareness about the sugar content of food and drink products and to educate and inform about the impact of high sugar intake on health.

## Discussion

Reduced prevalence of daily soft drink consumption were observed in all countries examined in this report. Trends of decline in soft drink consumption are in line with the overall trend in countries participating in the HBSC study (5). Reduced soft drink consumption might reflect a societal trend of reduced interest of sugar added products. The downward trend in soft drink consumption is promising since food habits established in adolescence tend to continue later in life. However, the present findings does not necessary reflect reduced interest of beverages in general, as sugary soft drinks might have been replaced by artificially sweetened sugar drinks. As intake of sugary soft drinks is associated with overweight, declined soft drink consumption could potentially lead to decreased prevalence of overweight and obesity. However, the observed rates of overweight and obesity did not follow the same pattern of decline in any of the respective countries.

In Norway and UK, percentages of adolescents reporting daily soft drink consumption declined with more than to thirds during 2002 - 2018. The encouraging trends should be viewed in the context of national policy actions. Overall, 31 national policy actions were identified in UK, 24 in Norway, in the NOURISHING database. The common denominator for UK and Norway's policy actions targeting soft drink consumption were sugar taxes, advertising ban on unhealthy food and drinks, and campaign and educational programs to raise awareness about sugar content and its link to health. However, some of the identified policy actions were implemented recently and could only partly explain the observed changes during the time period 2002-2018. Tax on non-alcoholic beverages was implemented also in Portugal, although the Portuguese tax is lower compared to current taxes in UK and Norway.

Although a reduction in sugary soft drinks was observed among Polish boys and girls, trends in this population showed another picture compared to the other countries studies in this report. Absolute as well as relative decline in soft drink consumption were lower in Poland compared to the other countries. This may be explained by our findings of only one policy action targeting soft drink consumption. The fact that Poland also showed the greatest increase in overweight and obesity prevalence might underscore the urgent need for focusing on national policies targeting both sugar intake and EBRB in general.

A sharp decline in soft drink consumption was observed in the Netherlands, in which few (9) total policy actions were identified, and no policy initiatives targeting soft drink consumption in particular. This observed changes in the context of few identified policy actions targeting soft drink consumption might be surprising. However, the NOURISHING database excludes subnational and local policies, and we do not know if such initiatives are widespread in the Netherlands. Further, the NOURISHING policy scan is not yet completed. The Netherlands might potentially have several relevant national policy actions implemented but not yet registered in the database.

The NOURISHING database do not infer any hierarchic or preferred policy actions. Both upstream and downstream initiatives are suggested to be relevant policy actions when aiming to influence people's sugar intake. However, upstream initiatives are suggested to be most effective in groups with high socio-economic status and could potentially increase social inequalities. This is relevant as social inequalities in sugary soft drink consumption increased in about 40% of adolescents participating in the HBSC study.

More research is needed to provide a more comprehensive picture of policy actions relevant to explain current changes in young people's EBRB. There is an ongoing process within the CO-CREATE project to do further policy scans and to update the NOURISHING and MOVING databases. Alongside this work, effort is devoted to the process of developing policy indexes. This will be of particular importance with regard to CO-CREATE delivery 3.7, in which we aim to provide a comprehensive overview of time-related changes in overweight, obesity and EBRB in relation to changes in national diet and physical activity policies, including policy index based on NOURISHING and MOVING.

## Conclusion

In the CO-CREATE countries studied in this report, trends of reduced soft drink consumption were observed in all five countries. By contrast, no country showed reduced prevalence of overweight and obesity rates. The extent to which policy actions were implemented in the respective countries varied greatly, however it is important to recognise that the policy scans are not yet complete. Further analyses at the national level should be carried out to better understand why some countries (especially The Netherlands, UK and Norway) have experienced sharper declines than others. Further, despite trends of decline, the prevalence of daily consumers are high in most of the countries, particularly among boys.

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