

2019



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774210



Obesity mapping: a conceptual framework

Deliverable 4.4

London School of Hygiene and
Tropical Medicine
31.07.2019



Deliverable administration and summary			
Due date	31.07.2019		
Submission date	04.07.2019		
Deliverable type	Report		
Contributors:	Name	Organisation	Role / Title
Deliverable Leader	Natalie Savona	LSHTM	WP Lead/Assistant Professor
Contributing Author(s)	Cécile Knai	LSHTM	LSHTM Lead/Associate Professor
	Talia Macauley		Research Assistant
Reviewer(s)	Harry Rutter	University of Bath/LSHTM	PI/Professor
Final review and approval	Harry Rutter	University of Bath/LSHTM	PI/Professor

Document change history				
Version	Release date	Reason for Change	Status (Draft/In-review/Submitted)	Distribution

Dissemination level	
PU	Public

Executive Summary

This qualitative study is a core primary research component of the CO-CREATE project and forms WP4 (Obesity System Mapping), led by The London School of Hygiene and Tropical Medicine. This report describes the country-specific and summative conceptual frameworks derived from the system maps (see Deliverable 4.1) created with adolescents in Poland, Portugal, The Netherlands, Norway, South Africa and the United Kingdom. During system mapping workshops, participants were guided through the group model building process to produce causal loop diagrams; these represent the participants' views on the determinants of adolescent diets and physical activity, as they pertain to obesity. We then created conceptual frameworks for each participating country illustrating domains of interest related to the drivers of adolescent obesity, drawing on the qualitative data gathered during each system mapping session in schools with young people. The conceptual frameworks purposefully avoid making linear linkages between factors listed, but rather highlight areas of interest or concern according to the young people involved. Included in this report are the conceptual frameworks representing the views of adolescents in Poland, Portugal, Norway and the United Kingdom; also included is a summative conceptual map highlighting the most frequently mentioned domains of interest across all groups and all countries. The conceptual frameworks will contribute to activities in CO-CREATE WP5 and WP6 in which adolescents will form Alliances to develop policy responses that take a systems approach to the problem of adolescent obesity.



Table of contents

Executive Summary	3
List of acronyms / abbreviations	5
List of figures and tables	5
Introduction.....	6
Deliverable description	6
Objective of deliverable	6
Brief overview of conceptual frameworks of obesity	6
Example of existing obesity conceptual frameworks.....	6
Method for creating a conceptual framework from system maps	10
Results	10
Conceptual framework for schools in the United Kingdom	10
Conceptual framework for schools in Norway.....	10
Conceptual framework for schools in Poland	11
Conceptual framework for schools in Portugal.....	11
Conceptual framework for schools in the Netherlands	16
Conceptual framework for schools in South Africa.....	16
Summative conceptual framework across all groups	16
Conclusion	19
References.....	20



List of acronyms / abbreviations

BMI	Body Mass Index
IOTF	International Obesity Task Force
PA	Physical activity
WP	Work package
UK	United Kingdom

List of figures and tables

Figure 1. The 1999 IOTF causal web of societal influences on obesity prevalence	7
Figure 2. An ecological model for understanding obesity.....	7
Figure 3. A 2011 framework to categorise obesity determinants and solutions.....	8
Figure 4. 2012 conceptual framework describing the aetiology of childhood obesity.....	9
Figure 5. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in three system mapping workshops in the United Kingdom	12
Figure 6. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in three system mapping workshops in Norway	13
Figure 7. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in four system mapping workshops in Poland.....	14
Figure 8. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in four system mapping workshops in Portugal	15
Figure 9. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in system mapping workshops across schools in four countries (Poland, Portugal, Norway and the United Kingdom)	18

Introduction

Deliverable description

In line with the European Commission Research Executive Agency/ Horizon 2020 Grant Agreement number 774210 — CO-CREATE, this report fulfils the requirement of Deliverable 4.4 from Work Package 4: *“A report describing the conceptual framework derived in deliverable 4.1 will be provided. This report will support the WP 6 dialogue forum.”*

Objective of deliverable

The objective of the deliverable is to present the country-specific and summative conceptual frameworks of the drivers of adolescent obesity, based on causal loop diagrams generated during workshops with adolescents in six countries. The conceptual frameworks are in effect, data resulting from the workshops, representing the views of the participants. In this report, the conceptual frameworks will be contextualised within some background on the topic, and the methodology used to design the conceptual frameworks from the system maps.

Brief overview of conceptual frameworks of obesity

A conceptual framework is an illustration of the system of concepts, assumptions, expectations, beliefs, and theories that support and inform research and action. It explains, either graphically or in narrative form, the main things to be studied such as the key factors, concepts, or variables, and the presumed relationships between them. [1]

Example of existing obesity conceptual frameworks

The following is not an exhaustive list of conceptual frameworks by any means, but rather one that illustrates some of the various conceptual frameworks designed to provide explanatory theories driving obesity.

Figure 1 reproduces one of the most widely employed frameworks, developed in 1999 by the then International Obesity Task Force (now World Obesity Federation); one of its main advantages is that it highlights the multiple focal points across the sectors of interest. The IOTF framework provides a way to identify the leverage points where interventions might be focused, recognizing opportunities for vertical integration of policies, and identifying sectors and subsectors that lend themselves to natural alliances. It also suggests intermediate outcomes that can be used as indicators of success in moving toward reduced population body mass index (BMI) levels.[2]

Figure 1. The 1999 IOTF causal web of societal influences on obesity prevalence

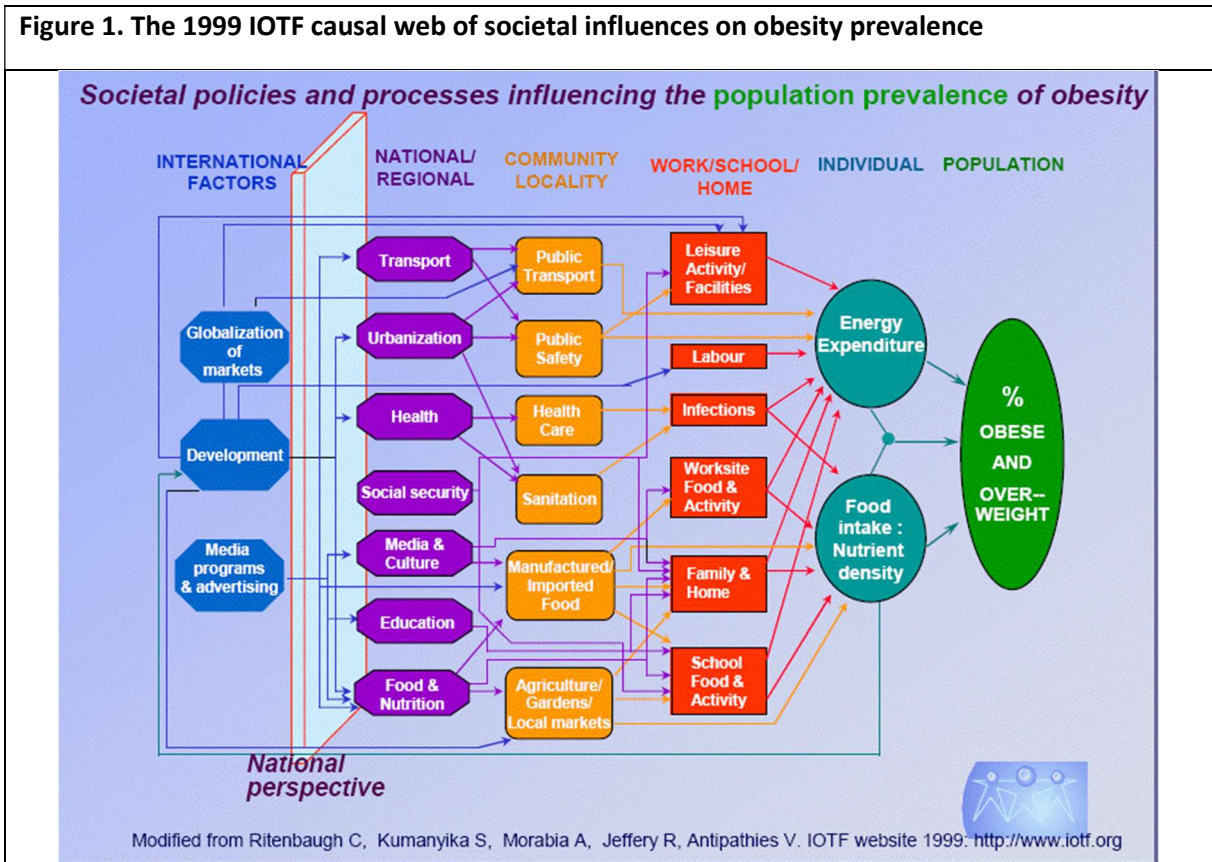
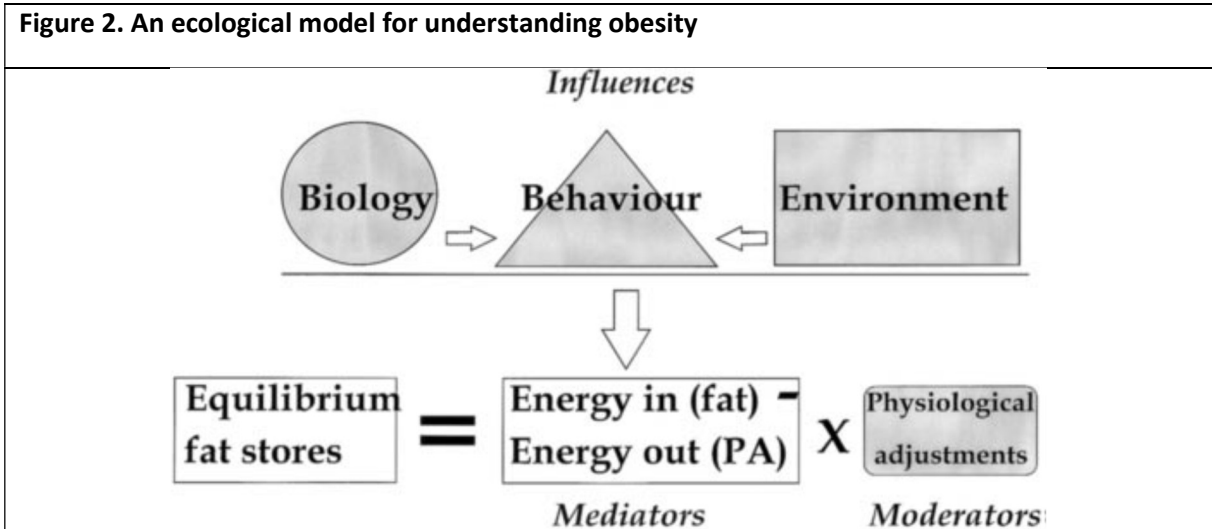


Figure 2 reproduces the 1999 framework by Swinburn et al which incorporates environmental as well as biological and behavioural influences on obesity. [3]

Figure 2. An ecological model for understanding obesity



Source: Swinburn et al (1999) [4]

A more developed and dynamic conceptual framework is reproduced in Figure 3, also by Swinburn and colleagues. [5] The more upstream drivers are listed to the left of the diagram; they also provide indication of the environmental moderators that have an attenuating or accentuating effect, along with examples. This conceptual framework suggests that the usual interventions for environmental change are policy-based, whereas health promotion programmes can affect environments and behaviours. Finally this conceptual framework shows that the more upstream interventions targeting systemic drivers might have larger population effects, though their political implementation will be more challenging than health promotion programmes and medical services. [5]

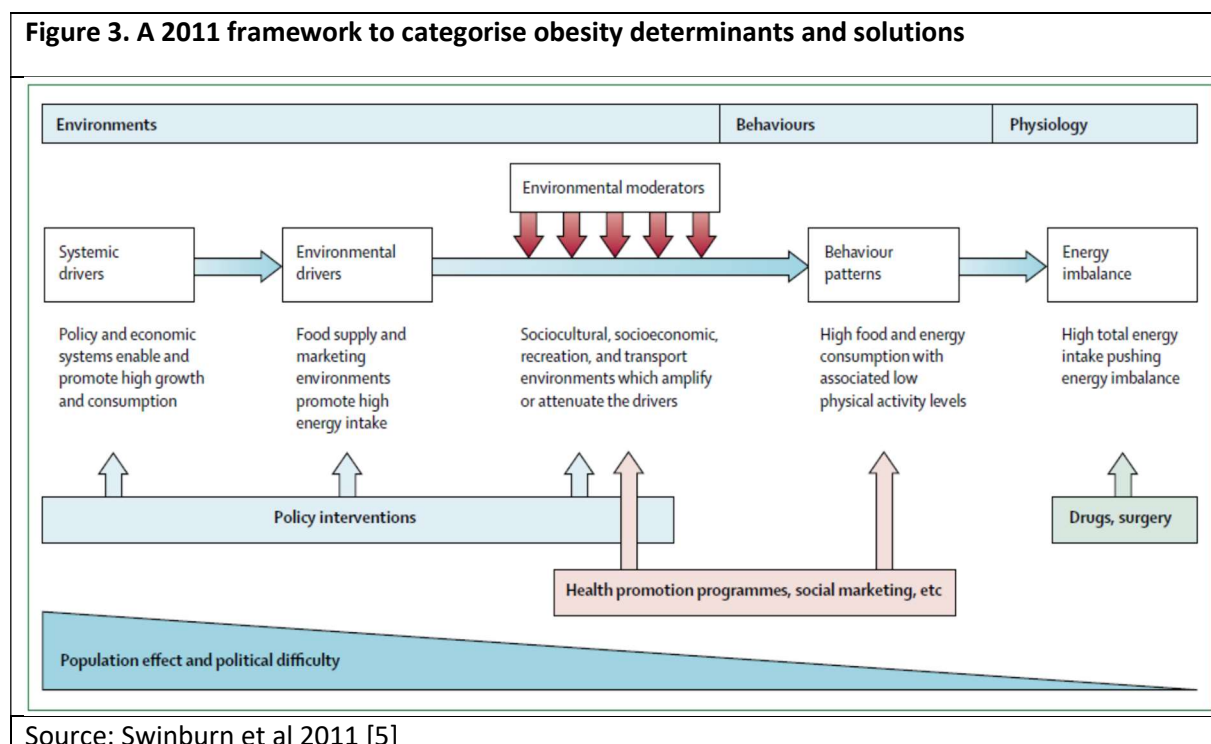
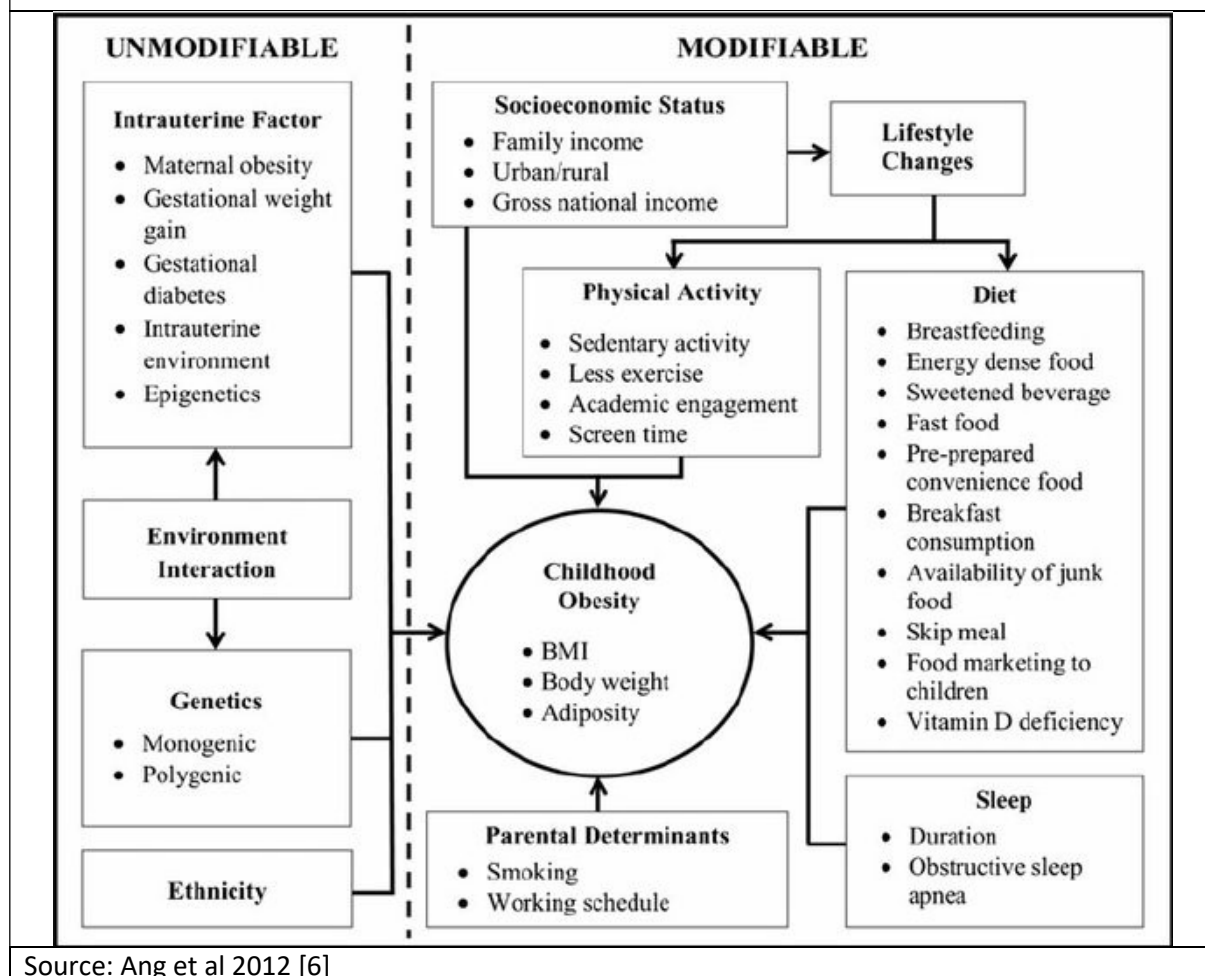


Figure 4 reproduces a framework specifically about childhood obesity, identifying several major modifiable and unmodifiable risk factors that may exert substantial influence on the aetiology of childhood obesity. [3]

Figure 4. 2012 conceptual framework describing the aetiology of childhood obesity


A common feature of the above conceptual frameworks is their broadly linear aspect, where arrows connect one factor to another, expressing a clear direction of travel toward the final outcome: obesity. The conceptual frameworks presented below illustrate domains that are drawn from the system maps created in workshops with adolescents (see Deliverable 4.1). These maps help distil the interconnecting parts of a system contributing to adolescent obesity and help to identify potential levers for change. The added value of the conceptual frameworks is to highlight the key domains of interest regarding what leads to excess weight gain, according to young people's lived experience. They can be useful as initial platforms for work on identifying policy solutions in the context of forthcoming Youth Alliances (WP5). They can be shared with young people taking part in Youth Alliances, as part of the starting point from where policy interventions might be focused.

Method for creating a conceptual framework from system maps

We have used as inspiration the IOTF framework (above) as a broad guide for the country-specific conceptual frameworks, exploring the factors expressed by young people across countries. The main changes as compared to the original IOTF framework is our addition of several categories including the retail environment, and most notably the online environment and individual mental health, as reflected in factors expressed by young people with whom we conducted the system mapping sessions. As described earlier, another main point of difference from the IOTF framework, is the lack of connections. We present one conceptual map for each country, drawing on the qualitative data gathered during mapping session in schools with young people. We also present one summative conceptual framework summarising the *most frequently* raised issues across all groups and countries, to date. We have employed a simple ‘heat map’ process to most vividly illustrate those issues mentioned in all (green), some (orange) or few (blue) groups of young people, in each country.

Results

Conceptual framework for schools in the United Kingdom

Figure 5 was drawn from three mapping workshops in schools in the United Kingdom. (At the time of reporting, a mapping workshop with a school in the London Borough of Lambeth has been planned for early October 2019. Additionally, two other schools across Lambeth and Southwark are interested in taking part.)

In the UK, all three groups of young people with whom we have created system maps highlighted the ubiquitous advertising and access to unhealthy foods and drinks, as well as the low cost of these products, making them that much more accessible. They strongly emphasised the role of stress, anxiety or depression, as well as negative pressures on body image or low body positivity, usually relating to social media influencers and celebrities on social media creating unrealistic expectations of what a healthy weight and ‘beautiful body’ should look like. They spoke about stress-, binge- or comfort-eating, excessive intake of unhealthy foods, and physical inactivity. One group mentioned the cost of leisure or fitness centres, and another raised the point that public transport is often used instead of active transport, all contributing to less physical activity. In terms of the broader societal issues, several students mentioned the role of the food industry and the power they have in producing and promoting processed food.

Conceptual framework for schools in Norway

The data in Figure 6 were drawn from three mapping workshops in schools in Norway. (A fourth has now taken place, but the data was not ready in time to be included in this report.) All classes in the Norwegian schools highlighted the role of the school environment as an important factor in obesity, including insufficient organised physical activity and unhealthy foods in the school canteens, as well as the need for knowledge on diet and physical activity as part of the curriculum. They also noted the importance of fast food restaurants as social meeting places for young people and convenience foods, contributing to consumption of junk food. As with other countries, all groups mentioned the

issue of availability of unhealthy foods, including via chain restaurants, as well as the issue of accessing opportunities for physical activity and engaging in sedentary behaviour. Also in line with other countries, was discussion of the role of screen time, and in two groups, the role of social media and the possibility for ‘air-brushed’ images, leading to distortion of body image was discussed. Related to this was the issue of stress, body image pressure and stigmatisation of larger body shapes, mentioned by some classes. The least frequently raised issues were similar to those considered in other countries, such as lack of sleep, comfort eating, pressure from family, and active transport. The participating adolescents in Norway were the only ones to mention the role of climate change.

Conceptual framework for schools in Poland

The source of data in Figure 7 is four mapping workshops in schools in Poland. All groups in the Polish schools mentioned household wealth or purchasing power as an important factor, for example in relation to accessing healthy food options. As with other countries, all groups raised the issue of stress, body image ideals and distortion, often linked to engagement with social media, the enhancement of body images online, and social pressure to have a beautiful body. Binge or comfort eating were mentioned by all groups as a way of coping with stress. Time was a factor discussed by some classes in relation to not having enough time for leisure or physical activity due to pressures from heavy daily schedules and school duties; other barriers to physical activity included psychological barriers such as the fear of injury. The Polish groups were the only ones to raise issues such as scientific research on diet or sports medicine, and the importance of sport infrastructure. Other less common factors were water consumption, the use of sedatives or stimulants, eating disorders such as anorexia or bulimia, the popularity of veganism and vegetarianism, and the role of weather in motivating individuals to take physical exercise.

Conceptual framework for schools in Portugal

Four mapping workshops in schools in Portugal are the source of data shown in Figure 8. All groups in the Portuguese schools mentioned the importance of positive relationships with parents as well as the issue of cooking (in terms of lack of time, motivation and skills). Also raised by all was marketing and accessibility of fast food, but also the high cost of healthier options as a barrier to consuming them. As with other countries, screen time and social media were considered important drivers of obesity by all, as were mental health issues such as stress and depression. Linked to these factors were the role of social media influencers, celebrities, often related pressures on body image, at times resulting in lack of motivation to exercise or eat well, lack of sleep, and use of alcohol, drugs and tobacco.

Figure 5. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in three system mapping workshops in the United Kingdom

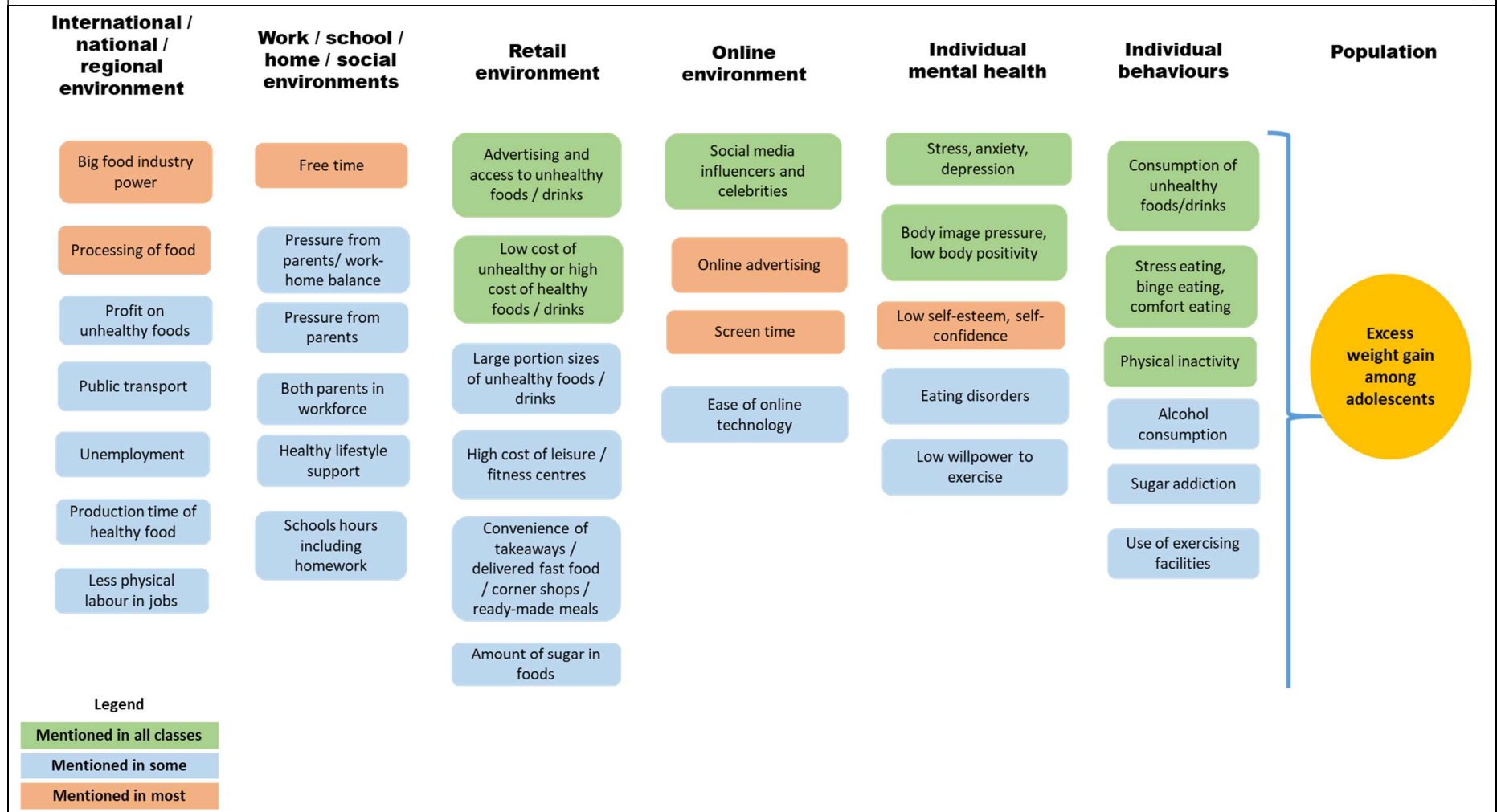
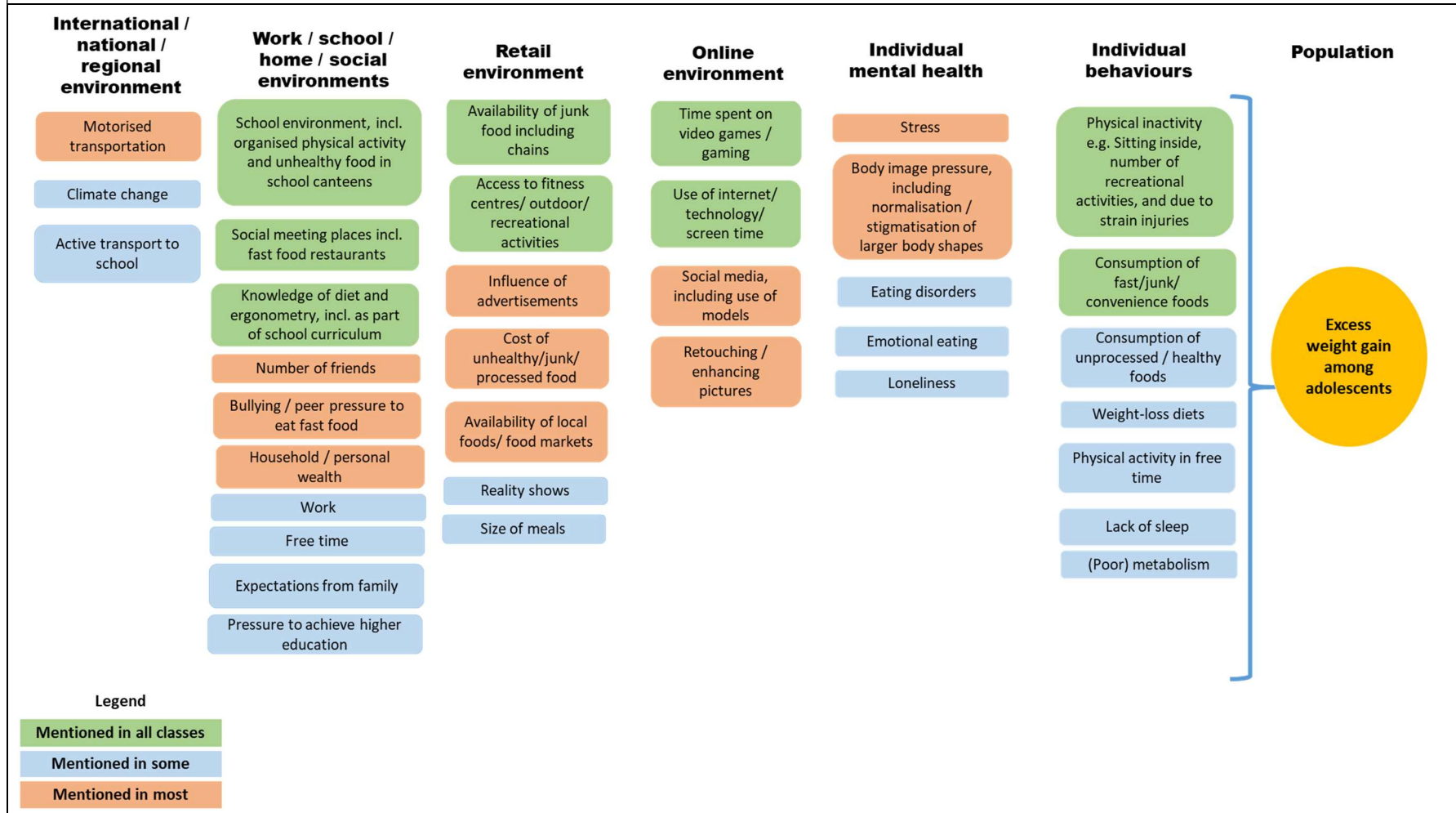


Figure 6. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in three system mapping workshops in Norway



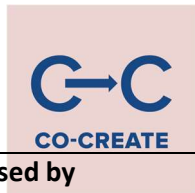


Figure 7. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in four system mapping workshops in Poland

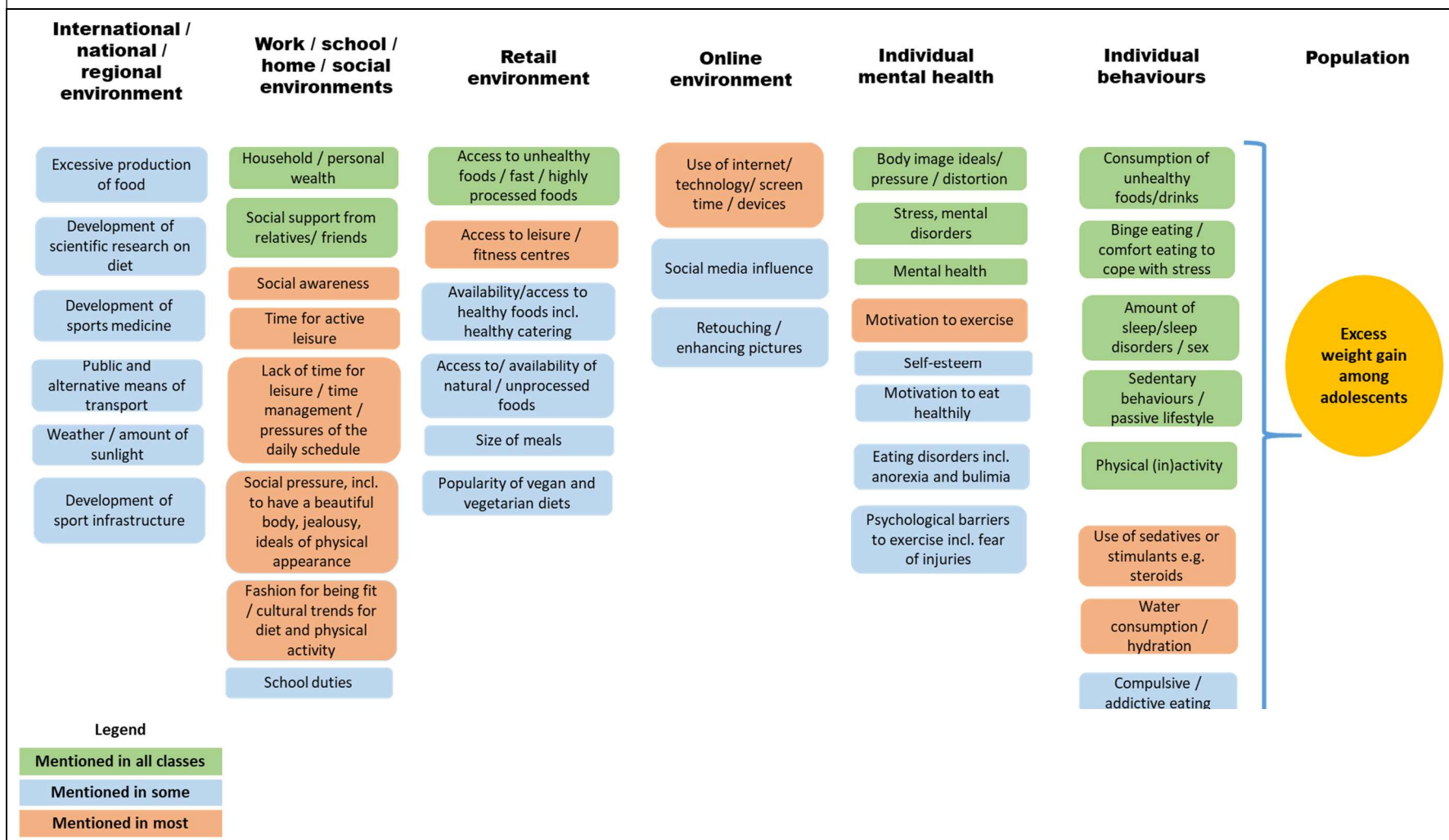
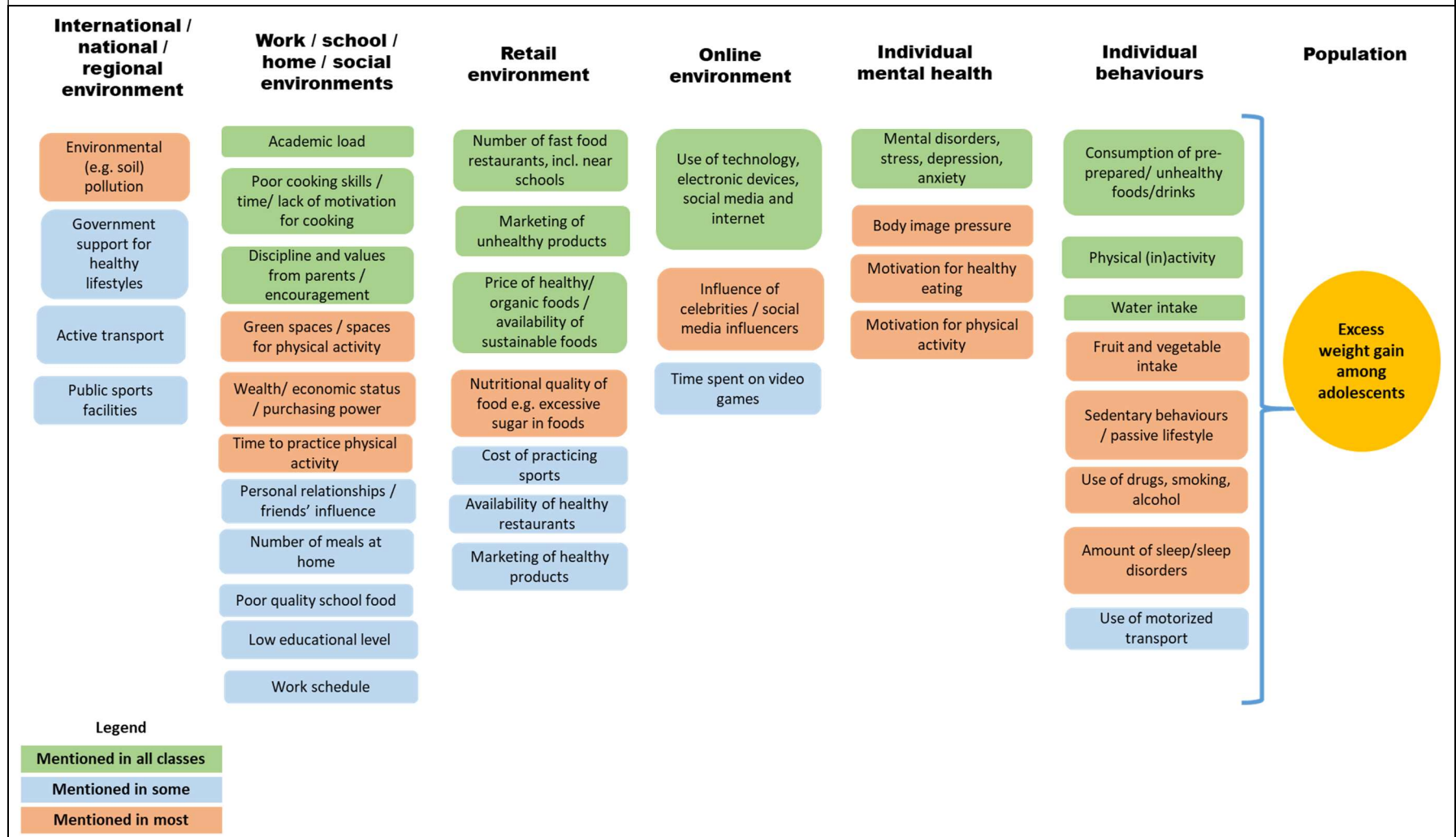


Figure 8. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in four system mapping workshops in Portugal





Conceptual framework for schools in the Netherlands

At the time of reporting work was ongoing in the Netherlands to finalise recruitment of adolescents for the mapping sessions and to set up workshop dates with them.

1. Almere; 10 participants; 19 and 20 June
2. Almere; church group currently in discussion about setting up a session
3. Amsterdam; group in high school; 24 June and 1 July
4. Amsterdam; through contacts of a CO-CREATE staff member, a group is being set up.

Conceptual framework for schools in South Africa

Adolescents in public schools in South Africa write exams in May and no access is allowed to schools during this time; then they are on holiday in June. The third school term is from 9 July to 20 September 2019. Therefore, the following have been planned for mapping sessions:

22-25 July:	Session #1 at School 1
29 July-1 August:	Session #2 at School 1
	Session #1 at School 2
5-8 August:	Session #2 at School 2
12-15 August	Session #1 at School 3 and School 4
22-25 August	Session #2 at School 3 and School 4

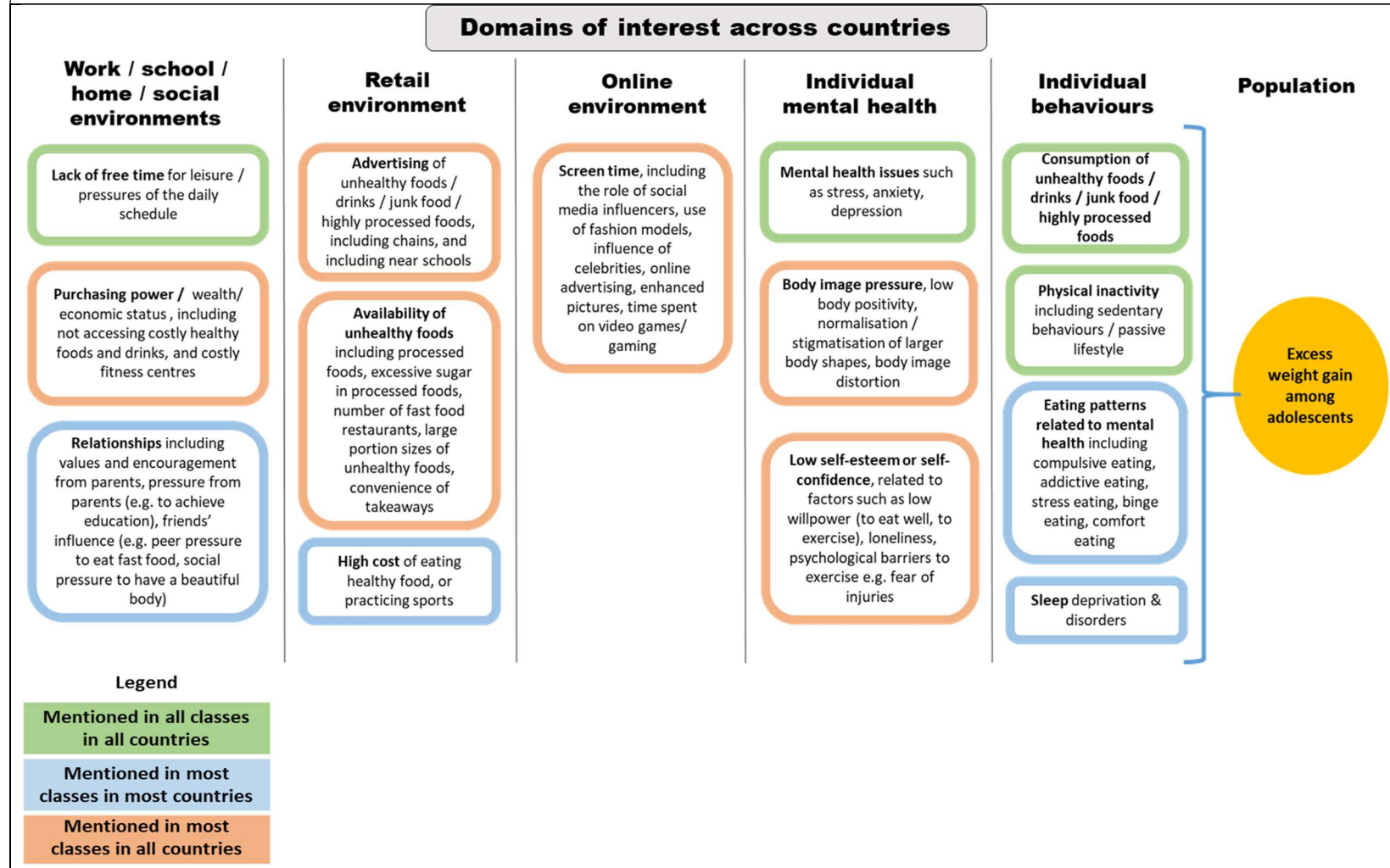
Summative conceptual framework across all groups

Figure 9 below is a summative conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in system mapping workshops across schools in four countries (Portugal, Poland, Norway and the United Kingdom). In green boxes are drivers of obesity mentioned by all classes across all four countries; some of these are as expected, such as consumption of unhealthy foods and physical inactivity, and others less so: all classes mentioned that time, and time pressures (either through school duties, or work) affected factors such as the ability to make a meal and to take exercise. Finally, all classes spoke of mental health issues contributing to in some way to obesity, and mentioned anxiety, depression, and stress, often related to other factors listed in the framework. Most classes in most schools (in blue) raised mental health related eating patterns, citing compulsive, addictive, stress, binge or comfort eating, often as a way of coping with stress or other mental health issues. One such factor is body image pressure, one of several factors raised by the majority of classes in all countries (in orange boxes). This was often raised in relation to the role of influencers and celebrities on social media, and the air-brushing of pictures online, perpetuating distorted ideals of beauty, and resulting in low body positivity. Low self-esteem or self-confidence were mentioned by most classes in all countries, and this was often related to social media, for example expressed as a cycle of too much screen time, being affected by social media, leading to poor self-esteem, lack of willpower to for example eat well



or exercise, loneliness, and more screen time. The majority of classes in all countries raised screen time as a factor; participants mentioned time spent playing video games as well as time following social media as mentioned above. Boxes in blue indicate factors mentioned by most schools in most countries, such as mental health related eating patterns as mentioned above, sleep deprivation and disorders, relationships (both positive – such as encouragement and support - and negative – such as peer pressure and bullying) with family and friends, and the high cost of eating healthily or exercising (e.g. via fitness centres). This was often mentioned alongside the issue of limited purchasing power – a factor mentioned in most classes in all countries (orange box). Finally, most schools in all classes spoke about advertising and accessibility of unhealthy foods, citing for example the convenience and low cost of such products, and the proximity of fast food chains to schools.

Figure 9. CO-CREATE conceptual framework illustrating domains of interest relating to drivers of adolescent obesity, as expressed by adolescents participating in system mapping workshops across schools in four countries (Poland, Portugal, Norway and the United Kingdom)





Conclusion

This qualitative study is a core primary research component of the CO-CREATE project and forms WP4 (Obesity System Mapping), led by The London School of Hygiene and Tropical Medicine. This report describes the country-specific and summative conceptual frameworks derived from the system maps (D4.1) created with adolescents in four countries (Poland, Portugal, Norway and the United Kingdom). Other participating CO-CREATE countries - the Netherlands and South Africa – are planning system mapping sessions with young people in the coming weeks. The summative conceptual framework will be updated accordingly.

Beyond the factors that were relatively expected such as advertising and access to unhealthy foods, and lack of physical activity, young people across countries mentioned the role of mental health, screen time and social media, and body image pressures, as important drivers of adolescent obesity.

These conceptual frameworks function as an illustration of key domains expressed by young people, rather than an illustration of linear relationships. Their added value is to illustrate the key interest or “pain points” regarding what leads to excess weight gain, according to young people’s lived experience. They will be useful as initial platforms for work on identifying policy solutions in the context of forthcoming Youth Alliances (WP5). These can be shared with young people taking part in Youth Alliances, as one of various starting points for where policy interventions might be focused.

References

1. Miles MB, Huberman AM. *Qualitative Data Analysis an Expanded Sourcebook*. Thousand Oaks, CA: Sage Publications; 1994.
2. Kumanyika S. MINISYMPOSIUM ON OBESITY: Overview and Some Strategic Considerations. *Annual Review of Public Health*. **2001**, *22*, 293-308.
3. Swinburn B. Dissecting and influencing obesogenic environments: Deakin University; 2001 [cited 2003 20 November 2003]. Available from: <http://depts.washington.edu/obesity/confdec2001/washington2001.ppt>
4. Swinburn B, Egger G, Raza F. Dissecting obesogenic environments: The development and application of a framework for identifying and prioritizing environmental interventions for obesity. *Preventive Medicine*. **1999**, *29*, 563-70.
5. Swinburn BA, Sacks G, Hall KD, et al. The global obesity pandemic: shaped by global drivers and local environments. *Lancet*. **2011**, *378*, 804-14.
6. Ang YN, Wee BS, Poh BK, et al. Multifactorial Influences of Childhood Obesity. *Current obesity reports*. **2013**, 10–22.



→ The **CO-CREATE project** has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 774210. The products of the research are the responsibility of the authors: the European Commission is not responsible for any use that may be made of them.

