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CHILDHOOD OBESITY: THE ECOG OBESITY EBOOK ON CHILD AND ADOLESCENT OBESITY

Child obesity is one of the most serious global public health challenges of the 21st century. During the last four decades, the number of school-age children and adolescents with obesity has risen more than 10-fold, from 11 million to 124 million in 2016. World Obesity Federation has estimated that some 280 million children (age 5-19y) will be living with obesity by the year 2030, the great majority of these living in low-income countries. In this issue of *The Global Fruit & Veg Newsletter*, Tim Lobstein gives a brief update on the most recent developments in prevalence of childhood obesity around the world.

In recent years, many studies have correlated the nutrition of the first 1,000 days of life with the development of obesity. Early adoption of healthy eating habits could drive the development of favourable metabolic patterns, thus reducing the risk of obesity development later on. Margherita Caroli and Andrea Vania briefly delineate why correct weaning practices are considered a pivotal factor of prevention at no cost in counteracting the epidemic of paediatric obesity.

Further, child obesity is increasingly recognized as a global child rights concern. Amandine Garde summarizes how a child rights approach to obesity increases the opportunities for, and pressure on, States to address the underlying determinants of health and effectively regulate the food industry. The article briefly delineates why states must anticipate legal challenges, why regulation must be tailored to achieve its objective and why political stakeholders need to understand legal constraints to effectively prevent childhood obesity.

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Prevalence and trends of childhood obesity across the World

Tim Lobstein

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Childhood obesity is one of the most serious global public health challenges of the 21st century, affecting every country in the world. In just 40 years the number of school-age children and adolescents with obesity has risen more than 10-fold, from 11 million to 124 million in 2016. In addition, an estimated 216 million were classified as overweight but not obese in 2016[1].

Prevalence

Several regions are of particular concern: Latin America countries have shown a doubling of childhood obesity levels in just 20 years. In the Middle East from Egypt through to the Gulf, obesity prevalence levels are around 15-20 %, while some Pacific and Caribbean islands are experiencing adolescent obesity prevalence above 30%. Small island states lead the rapid rise in prevalence of obesity around the world (Table 1).

How many children?

Prevalence levels are only part of the story. The total numbers of children living with obesity are another, and the World Obesity Federation has estimated that some 280 million children (age 5-19y) will be living with obesity by the year 2030[3]. The great majority of these children will be in low-income countries. Based on current trends, the World Obesity Federation has estimated that at least 25 countries will have more than a million children living with obesity by 2030. Only the Russian Federation and the USA classify as high income countries (Table 2).

Policy response to the rapid increase in numbers of children living with obesity

In response to this rapid rise (Table 3), all countries have agreed a set of global targets for halting the increase in obesity. This includes no increase in overweight among children under age 5, school-age children or adolescents by 2025 (from 2010 levels)[4]. Action to reverse the epidemic is the focus of the recommendations made by the WHO Commission on Ending Childhood Obesity[5] and is one of the main objectives of the Decade of Action on Nutrition[6]. Although most countries are still off-track to meet the 2025 targets, many are taking action and some have achieved a levelling-off in childhood obesity rates[1].

Table 1: Top twenty countries with the highest percentage of youth (10-19 years old) categorised as obese, 2017

Country	Percentage of youth 10-19y categorised as obese, 2017
Nauru	32.3
Cook Islands	31.3
Palau	30.4
Niue	28.8
Tuvalu	26.4
Tonga	25.8
Marshall Islands	25.3
Tokelau	23.8
Kuwait	23.0
Kiribati	21.9
United States of America	21.0
Samoa	20.8
Micronesia	19.8
Qatar	17.9
Puerto Rico	17.6
Saudi Arabia	17.1
Bahamas	15.9
Bahrain	15.8
Egypt	15.6
New Zealand	15.3

Source: WHO[2]

Table 2: Twenty-five countries that will have over 1 million children living in obesity in 2030

Country	Number of children 5-19y with obesity, 2030
China	37,887,009
India	14,789,136
United States of America	11,001,631
Indonesia	5,235,021
Brazil	4,517,818
Egypt	4,175,486
Mexico	4,115,673
Nigeria	3,167,370
Pakistan	3,114,125
South Africa	2,770,984
Turkey	2,062,925
Bangladesh	2,059,431
Iraq	2,037,743
Iran	1,944,425
Philippines	1,842,512
Algeria	1,716,898
Russian Federation	1,402,330
Argentina	1,349,879
Thailand	1,325,799
Saudi Arabia	1,296,075
DR Congo	1,280,160
Tanzania	1,167,477
Morocco	1,088,010
Malaysia	1,085,876
Vietnam	1,045,658

Source: WOF[3]

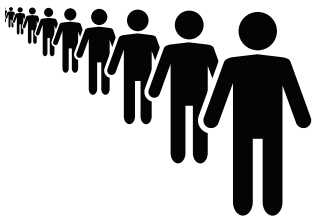

Table 3: Global projected numbers of children aged 5-19 years old living with obesity

Year	2020	2025	2030
Numbers of children living with obesity in the World	158m	206m	254m

Source: WOF[3]

Based on: Lobstein T (2015). Prevalence And Trends Across The World. In M.L. Frelut (Ed.), The ECOG's eBook on Child and Adolescent Obesity. Retrieved fromebook.ecog-obesity.eu

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3. Atlas of Childhood Obesity 2019, World Obesity Federation.
4. Resolution 65.6 (2012) and Resolution 66.10 (2013). World Health Assembly.
5. Report of the Commission on Ending Childhood Obesity. World Health Organization 2016.
6. Decade of Nutrition 2016-2025. United Nations 2018.

Weaning practices and later obesity

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In recent years, many studies have correlated nutrition during the first 1,000 days of life to the development of obesity[1]. In this timespan, correct weaning practices are considered a very important factor of prevention at no cost in counteracting the epidemic of paediatric obesity.

When speaking of long term effects of early nutrition, "programming" has to be differentiated from "tracking". Programming is a phenomenon in which stimulus acting during a specific critical period has a lasting or lifelong impact: a high protein intake during the first 2 years of age leading to an increased risk of developing obesity later on.

Tracking consists of dietary and behavioural patterns starting early in infancy, with possible positive or negative effects related to repeated exposure: a high salt intake starting during infancy and lasting beyond may increase blood pressure and lead to hypertension.

Complementary feeding (CF) influences later obesity development through several mechanisms: the age when solid foods start to be offered, the excess of calories intake, the excessive or insufficient intake of specific nutrients, the quality of specific nutrients, the development of eating habits, and so on.

Two systematic reviews recently conclude that a clear association between the timing of the introduction of CF and childhood overweight or obesity is still lacking[2,3]. However, there is some evidence that a very early starting of CF (at, or before, 4 months), rather than at 4-6 months or >6 months, may increase the risk of childhood overweight.

The role of nutrients in promoting obesity development in later ages has to be approached in terms of both quantity and quality.

Nutrients intake

Proteins: High protein intake in infancy, and particularly high dairy and meat protein intake, seems to be associated with the risk of developing obesity later on, but further research is needed to better clarify the nature of this association[4].

Fats: Also, a significant fat restriction in the first two years of life could promote the susceptibility to obesity development when the child is exposed to a high-fat diet later in life[5].

Carbohydrates: Most of the researches on carbohydrates intake are addressed to simple sugars present in sugared soft beverages (SSBs). Studies with a larger sample size and/or a longer follow-up show a stronger association between SSBs intake and obesity[6], whereas cross-sectional studies with a smaller sample size and/or longitudinal studies with a shorter follow-up do not find any association[7].

High SSBs intake with no compensation by a lower energy intake from other food sources is the most likely way through which obesity development is triggered. In addition, fructose sweetened beverages can have an impact on satiety, as fructose has been demonstrated to have a lower satiating power than glucose. Furthermore, fructose sweetened beverages decrease leptin levels and increase ghrelin levels. Since insulin and leptin, and possibly ghrelin, function as key signals to the central nervous system in the long-term regulation of energy balance, a decrease of circulating insulin and leptin and an increase of ghrelin concentrations, caused by high intake of fructose, may lead to increased caloric intakes and ultimately contribute to weight gain and obesity during chronic consumption of diets high in fructose[8].

Food preference

The influence of the CF in favouring obesity development is not restricted to the effects of nutritional and metabolic factors. Infants tend to like sweet and salty tastes and to dislike sour and acid ones. These innate preferences can favour later in life unhealthy foods intake, since energy dense, palatable foods rich in fat, sugar or salt are abundant in our contemporary food environment[9].

Since early food preferences may track for long time, even in some cases until adulthood, it is important to modify them through a "food learning" process.

In conclusion, weaning should be considered an important moment to establish healthy eating habits that could drive a safe development of metabolic patterns, reducing the risk of obesity development later on.

Based on: Caroli M (2015). Weaning Practices And Later Obesity. In M.L. Frelut (Ed.), The ECOG's eBook on Child and Adolescent Obesity. Retrieved from ebook.ecog-obesity.eu

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Law as an important discipline for the prevention of child obesity

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Child obesity is increasingly perceived both as a major public health and a global child rights concern. By recognizing children as rights holders and States as corresponding duty bearers, the UN Convention on the Rights of the Child increases the legal mandate that States have to protect the child right to health and other related rights. A child rights approach to obesity therefore increases the opportunities for, and pressure on, States to address the underlying determinants of health and effectively regulate the food industry.

However, the role that law as a discipline can play in the promotion of healthier diets is multifaceted. Legal rules do not exist in a vacuum and must be integrated within a pre-existing set of rules. In particular, the hierarchy of legal norms requires that laws on, e.g., food labelling, food marketing or food taxes, comply with higher laws, not least constitutional rules and those derived from international trade and investment law. States therefore need to understand the legal constraints within which they operate.

States must anticipate legal challenges

The food industry has developed some strategies that may oppose legal rules which would not foster its immediate interests –i.e. impede its ability to make profits. To ensure that these legal strategies are not unduly successful, States should not be intimated: a rights-based approach to chid obesity actually mandates that they do act where public health so requires. Nevertheless, strong political is not a sufficient condition for the law to be used effectively to promote healthier diets: States must also learn to anticipate legal challenges and ensure that the measures they adopt are able to withstand such challenges. They should therefore work from the earliest stage of the policy process with lawyers who can help them gather and frame the evidence required to support the adoption of a specific obesity prevention measure in light of existing legal tests that would have to be fulfilled if this measure was to be challenged. In particular, bearing in mind that rights (including the child's right to health) are rarely absolute, lawyers will help them understand, how children's rights can be balanced against the competing rights and interests that the food industry could invoke.

Regulation must be tailored to achieve its objective

The key legal principle of proportionality requires that a State can demonstrate that the means used to achieve a specific objective are tailored to the specific objective in question: the measure must be suitable to achieve the objective pursued and it must not exceed what is necessary to do so. For example, if a measure purports to protect children from the harmful impact of unhealthy food marketing, a State will need to identify what falls within the category of unhealthy food. A ban on the marketing of all food would be excessive as it would prevent business actors from promoting healthy food whose consumption should arguably be encouraged.

Understanding the margin of discretion a State has to protect the health of its citizens is complex. It requires engaging with lawyers to ensure that it has carried out the balancing exercise required, applying the vast case law developed by competent courts and tribunals to the specific circumstances of each case.

Understanding legal constraints to effectively prevent childhood obesity

It is arguable that the tide is turning. Law is increasingly used as a sword – to regulate the food industry and therefore create a level-playing field within which business actors have to operate – rather than merely as a shield – to defend specific measures from industry-led legal challenges. Ultimately, the more the constraints imposed by the law are understood, the more a State can maximise the opportunities it offers to effectively prevent child obesity in Europe and beyond.

Based on:

- Garde A (2015). Law, Healthy Diets and Obesity Prevention. In M.L. Frelut (Ed.), The ECOG's eBook on Child and Adolescent Obesity. Retrieved from ebook.ecog-obesity.eu
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