

Digital Food Marketing to Young People: A Substantial Public Health Challenge

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Prevention of childhood obesity is an international public health priority, given the significant impact of excess weight on acute and chronic diseases, general health, development and well-being [1]. Given the limited effect of interventions at the individual level [2], more comprehensive measures are needed in a “joined-up, whole systems approach” [3] in line with the EU Action Plan [4].

One area that has attracted considerable attention as a modifiable risk factor for unhealthy diets and weight gain is digital marketing. The proliferation of digital food and beverage marketing has led to concerns about the influence of this type of exposure on the health and well-being of children [5], particularly given their cognitive and developmental vulnerabilities [6]. In recent years, there has been a substantial shift in children’s media practices, from the dominance of television viewing to increasing time being spent online, including social media and content-sharing platforms (e.g., YouTube), subscription video on demand services (e.g., Netflix) and games (e.g., Fortnite) [7, 8]. Globally, one-third of internet users are children and they are online for an average of approximately 15 h per week, typically via portable

devices such as tablets, laptops or smartphones [7, 8]. While this ubiquitous connectivity clearly provides opportunity for widespread engagement with positive campaigns to fight obesity [9], there is a need to better understand where children spend their digital time and what messages they are receiving about food and eating. Despite many social media platforms (such as Facebook) setting minimum age requirements of 13 years, evidence shows that many people younger than this have profiles and are active on these sites with or without their caregivers’ knowledge and consent [8]. Where children have gone marketers have followed, and it is estimated that spend on digital marketing to children will reach USD 1.7 billion by 2021 [7]. The United States and China are the largest online advertising markets in the world, with the United Kingdom in the third place as the largest in Europe [10, 11].

Digital marketing, defined as “promotional activity, delivered through a digital medium, that seeks to maximise impact through creative and/or analytical methods” [5, p11] takes place in a complex ecosystem involving multiple actors including advertising technology (“adtech”) companies, publishers and brands/agencies

[12]. Marketing is largely delivered “programmatically” (i.e., automated buying and selling of targeted advertising impressions) [12]. It is driven by data analytics and powerful creative techniques, many of which are unique to the digital format (such as virtual environments and augmented realities) [5]. It has been estimated that by the age of 13 years, adtech companies have collected over 72 million data points on a child, equivalent to 12,000 pieces of data for each hour spent online [13]. Although this is almost certainly an underestimation given that this excludes the trackers used by Facebook, Twitter, and YouTube among others [13], this exemplifies the unique ability of digital marketing to be personalised and tailored to individuals, in a way that is likely to make the persuasive impact even greater than for generic campaigns [14].

In general, the role of screen time in driving obesity is well-known [15]. For television food advertising specifically, the extent of children’s likely exposure [16], the marketing techniques used [17], the impact on eating behaviour [18] and the evidence for a causal relationship with body weight [19] are relatively well characterised. For digital marketing, this is not yet the case. There are some fundamental ethical and legal barriers that make characterising digital marketing prevalence and effects challenging for researchers [20], while the platforms retain the answers in-house with little scrutiny [5]. Nevertheless, there is emerging evidence to suggest that food marketing is highly prevalent in digital spaces where young people gather. One study of 10 websites popular with adolescents (12–17 years) in Canada found 14.4 million food advertisements in a single year, with cakes, cookies, and ice cream the most frequently advertised products [21]. Another study examining YouTube videos popular with children reported that foods and beverages were advertised more frequently than any other product (38% of ads) and a majority (56.3%) promoted unhealthy foods [22]. One key feature of these studies is that they explore digital marketing to which children are likely to be exposed (by virtue of the popularity of the media with this age group) rather than what is “targeted” to children. As the impact of marketing on behaviour is a function of both exposure and power [23], it is typically more useful for researchers to use this approach rather than seeking to guess who the brands and marketers were hoping to reach.

Traditional advertising has tended to take a branding approach [24] and digital advertising appears to follow the same pattern [25]. Brand messaging is often deeply immersed in digital games, with contemporary advertis-

ing techniques including pop-ups and “unlock to play” advertisements evident [26, 27]. Brands can use digital media to cultivate more vibrant and interactive “brand personalities” in a way that was not possible with traditional media [28]. Digital marketers use tactics of peer engagement, emotion and entertainment to persuade young people to respond [29]. This appears critical to the effect [30]. Young people create posts on social media that replicate major food marketing campaigns [31] and this “earned media” can proliferate through social networks and across the digital sphere quickly and powerfully [28]. Similarly, brands are able to leverage the power of social media influencers to propagate their messages, and it appears to work. In a recent study, when children (9–11 years) were exposed to influencer marketing of unhealthy foods via YouTube, they consumed significantly more of the marketed snack relative to the alternative brand [32], demonstrating a brand-specific effect that was not tempered by the presence of a disclosure informing children that they were viewing marketing content. When the exposure was to influencer marketing via Instagram, a non-specific effect on intake was found whereby children consumed almost 100 kcal more than the control group at a subsequent snack opportunity where the marketed foods were not available [33]. This is consistent with the beyond-brand consumption effects seen for television food advertising [34, 35].

Although still in relative infancy, there is sufficient evidence emerging to suggest that concern about the public health implications of young people’s exposure to digital marketing for unhealthy foods and beverages is justified [36]. Where do researchers and policymakers go from here? Novel methodologies such as screen capture are showing promise for characterising marketing exposure through social media apps [37] and automated tools are under development that may support more widespread monitoring activity to generate evidence to inform policy developments in this area [12]. While effective regulation of the digital world is challenging and is yet to be achieved in any country [38], progress is being made to explore potential avenues for leverage [5] and provide a “best practice checklist” to inform government approaches [39]. There is progress shown by the introduction of the General Data Protection Regulations across the EU in 2018, and there are calls to update the Children’s Online Privacy Protection Act in the US [40]. However, more must be done, and quickly, to ensure that young people can participate freely in the digital world, benefitting from the information age to the maximum degree, without their dietary health being adversely affected.

Recommendations for Research and Further Action

We call for:

- Research to explore the impact of digital food and beverage marketing on normalisation of eating behaviours and longer-term effects on health outcomes in children (across childhood, from pre-schoolers to adolescents)
- Efforts to raise awareness of this issue among stakeholders including consumers (young people, parents), health campaigners and experts, and policymakers to encourage parental intervention and political will for action
- All relevant scientific societies dedicated to child health to work together to achieve meaningful policy progress to restrict children's exposure to marketing for unhealthy foods and beverages online
- Greater transparency from the food and beverage industries and the marketers with respect to the data they hold on digital food marketing prevalence and impact, and the facilitation of appropriate access for researchers to those data

- Governments to introduce or strengthen policies to restrict the exposure of young people (including adolescents) to the digital marketing of unhealthy foods and beverages.

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E.B. conceptualized the work, and led interpretation of literature and preparation of drafts. D.T., A.M., S.R.-D., M.-L.F., and D.W. made substantial contributions to the conception of the work and revised drafts critically for important intellectual content. All authors approved the final manuscript as submitted and agree to be accountable for all aspects of the work.

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