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Review

Review

Impact of unhealthy food/drink marketing exposure to children in New Zealand: a systematic narrative review

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Abstract

Unhealthy food and drink marketing exposure to children is known to influence children's dietary choices and the World Health Organization recommends governments protect children from the marketing of unhealthy commodities. This study aims to explore and synthesize children's unhealthy food and drink marketing exposure in New Zealand. A systematic search strategy was undertaken following the PRISMA guidelines. Eight databases were searched for studies from inception to January 2024 on marketing exposure of unhealthy food and drink to children aged 2–17 years. A deductive coding analysis was used, with codes sourced from a modified coding framework developed using a diagram sourced from the ASEAN and UNICEF (2023) report. The diagram demonstrates the pathway from marketing exposure to unhealthy food- and drink-related diseases. A total of 1019 studies were screened for eligibility. Forty-five studies met the inclusion criteria—five qualitative, 34 quantitative and four mixed-method studies. The results are presented in a narrative review format. Findings demonstrated children's exposure to unhealthy food/drink marketing is ubiquitous with clear links to dietary preference and consumption. To improve child health now and over the life course, unhealthy food/drink marketing needs to be subjected to greater restriction with enforceable legislation to protect children from exposure to unhealthy marketing, breaking the chain from exposure to ill health.

Keywords: advertising; marketing; unhealthy food and drink

Contribution to Health Promotion

- There is a clear and urgent need for banning unhealthy food and drink marketing exposure to children, especially in areas children visit most frequently.
- Unhealthy food/drink marketing restrictions are needed to protect our children from developing unhealthy eating habits.
- Health-promoting environments free from unhealthy food/drink marketing are needed to foster children's growth and development.

INTRODUCTION

The current marketing regulations in Aotearoa New Zealand (hereafter NZ) operate under voluntary codes and self-regulation by the industry. This approach has been deemed ineffective at protecting children from unhealthy food and drink marketing (Thornley et al. 2010, Sing et al. 2020, Garton, Mackay et al. 2022). There is abundant unhealthy food and drink advertising surrounding NZ schools that do not adhere to the Advertising Standards Authority (ASA) or the World Health Organization (WHO) marketing guidelines in that unhealthy food and drink advertising must not target children (Huang et al. 2020). The current NZ government set a commitment in their 2024–7 Policy Statement on Health to be proactive in responding and preventing non-communicable diseases by addressing environmental risk factors (Minister of Health 2024). Despite this, NZ has no current regulations that prohibit children's exposure to unhealthy food and drink marketing. As it stands NZ does not meet its own health targets nor international obligations to protect the rights of children (Thornley et al. 2010, Egli et al. 2023), as per the United Nations Convention on the Rights of the Child (General Assembly resolution 44/25 1989).

NZ is an industrialized nation in the South Pacific Ocean. With a population of 5.3 million (Stats NZ 2024), the country is culturally and ethnically diverse. The largest ethnic groups include NZ European, Māori, Pacific, Asians and other immigrant communities. It is governed by a democratic parliament, with both national and local government bodies

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(Encyclopedia Britannica 2024, Stats NZ 2024). Nonetheless, political decisions are heavily influenced by industry lobbyists (Chapple and Anderson 2018, Espiner 2023). Lobbyists make recommendations to politicians behind closed doors that support business interests, whilst community and public health groups do not have the same leverage to lobby government (Garton, Mackay et al. 2022, The Integrity Institute 2023).

Children in NZ are frequently exposed to the marketing of unhealthy commodities both directly and indirectly in the neighbourhoods where they live, play and go to school. Marketing is the direct and indirect persuasive messaging of products communicated in any setting, using any medium with the intent to influence a person's behaviour and the choices they make. There are many forms of marketing children are exposed to, common forms include product and brand placement and packaging, advertisements on screens, outdoor posters and billboards, advergames, sports sponsorship (Advertising Standards Authority, 2024a, b), and through social endorsement by influencers, schools, friends and family. Although people of all ages are affected by marketing, those most vulnerable are children and adolescents who are still developing their marketing literacy and critical appraisal skills (Pechmann et al. 2005, Rozendaal and Buijzen 2023).

It has been well researched that advertising of unhealthy food and drink, affects children's dietary choices (Carter et al. 2012, Brown 2016, Robertson et al. 2016). Furthermore, advertising not only affects a child's initial consumption but also regulates the reinforcement of continued consumption (Cairns et al. 2009, 2013). Consumption of unhealthy food and drink products causes children to have increased risk of developing a variety of ill-health conditions including digestive issues (Shah et al. 2023), cancer (Isaksen and Dankel 2023), cardiovascular disease (Honicky et al. 2022, Buckland et al. 2024), poor oral health (Bach and Manton 2014) and mental health problems (Park et al. 2016, Ejtahed et al. 2024). There is a growing body of evidence to suggest that all marketing is harmful as it influences children's identity by reinforcing the idea that children's purpose in life is as consumers of products (Powell 2020).

In 2023, the Association of Southeast Asian Nations (ASEAN) and the United Nations International Children's Emergency Fund (UNICEF) published a report describing the impact unhealthy food and drink marketing has on children's health, see Fig. 1. This figure shows the pathways by which increased the awareness of products by children leads to a desire and consumption of the unhealthy products and can lead to increased risk factors for ill health and diet-related diseases (ASEAN & UNICEF 2023). This flow diagram became the basis of our methods and how we interpreted our findings to demonstrate the wide berth of how unhealthy food and drink marketing has been reported in literature within NZ.

On average, children in NZ are exposed to double the amount of unhealthy food and drink advertisements compared to healthy food and drinks in outdoor settings (Brien et al. 2023) and it is likely this is impacting health outcomes. The most common chronic condition among children in NZ is dental caries (Coppell et al. 2013) and recent research conducted in NZ has shown statistically significant links between dietary patterns high in refined starch and sugar (the two most common ingredients in unhealthy food and drink) and dental caries in children (Bach and Manton 2014). Furthermore, the incidence of type 2 diabetes in young people is on the rise, particularly for Māori, Pacific and South-Asian ethnicities (Thornley et al. 2021).

This narrative review will explore and analyse the current research on unhealthy food and drink marketing exposure to children in NZ. The evidence has been analysed through a socio-ecological lens (Sallis and Owen 2015) and collated to inform policy and health promotion delivery to prevent the development of non-communicable diseases.

METHODS

Using a systematic literature search strategy registered with OSF in Jan 2024 (Frost 2024), we searched and extracted literature from Medline, Embase, CINAHL, Web of Science, Education Research Complete, Google Scholar, Scopus and Business Source Premier. Four concepts used to create the search query were 'New Zealand', 'children', 'advertising'

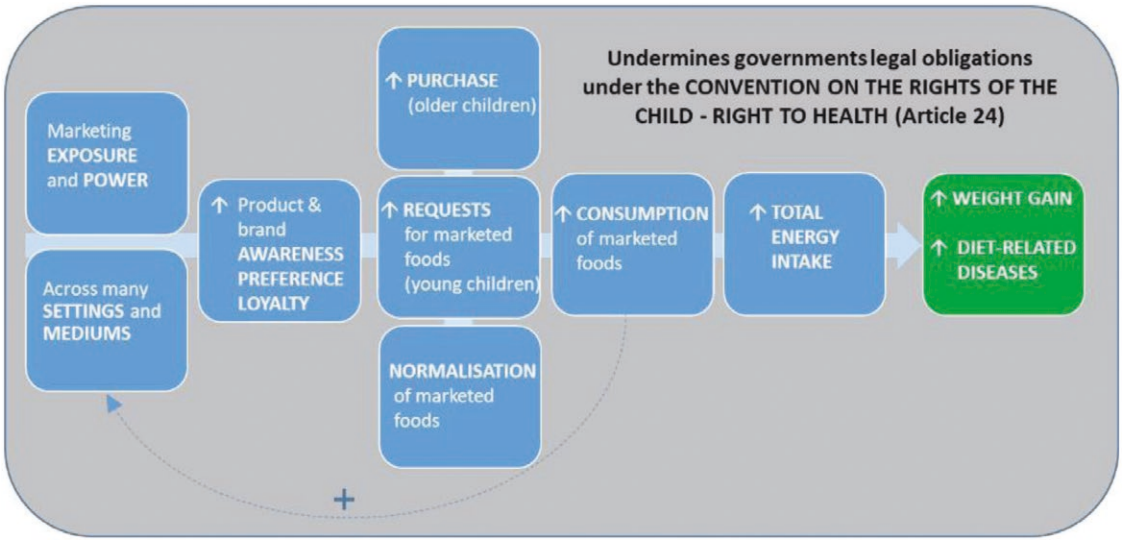

Figure 1. Pathway of effects between unhealthy food marketing, weight gain and diet-related disease. Sourced from ASEAN & UNICEF, 2023.

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and 'unhealthy food and drink'. The complete search query of all terms used and full details can be found in the research protocol (Frost 2024). The database search was completed on 05 January 2024. Articles were included if they were (1) empirical studies, (2) included children aged 2–17 years old, (3) located in NZ and (4) related to unhealthy food and drink marketing. As seen in Fig. 2, the PRISMA diagram once duplicates were removed 1019 articles were identified. After title, abstract and full-text screening, 45 articles met all inclusion criteria and went through to full-text review.

Articles were imported into NVIVO v.14. The coding framework derived from the ASEAN & UNICEF (2023) report (see Fig. 1) was modified to specifically suit the research question. The articles were then analysed deductively using this coding framework, see Figure 3. Using the codes and our definitions (Table 1), the results section of each article was coded to the framework, whether the results were positive or negative to the effects of marketing. We used a socio-ecological lens when defining the framework codes, acknowledging that children's choices are impacted by a complex system of interpersonal and intrapersonal factors (Sallis and Owen 2015). For example, 'Normalization' included if the child was exposed to marketing by friends and family or ease of access by being able to purchase products within their neighbourhood. The coding was completed by HF and 10% of articles were coded by VE for cross-comparison.

RESULTS AND DISCUSSION

The 45 articles included in our study are summarized in Supplementary Online Material. The results and discussion are presented concurrently, with each sub-heading linked to a step in the coding framework (Fig. 3).

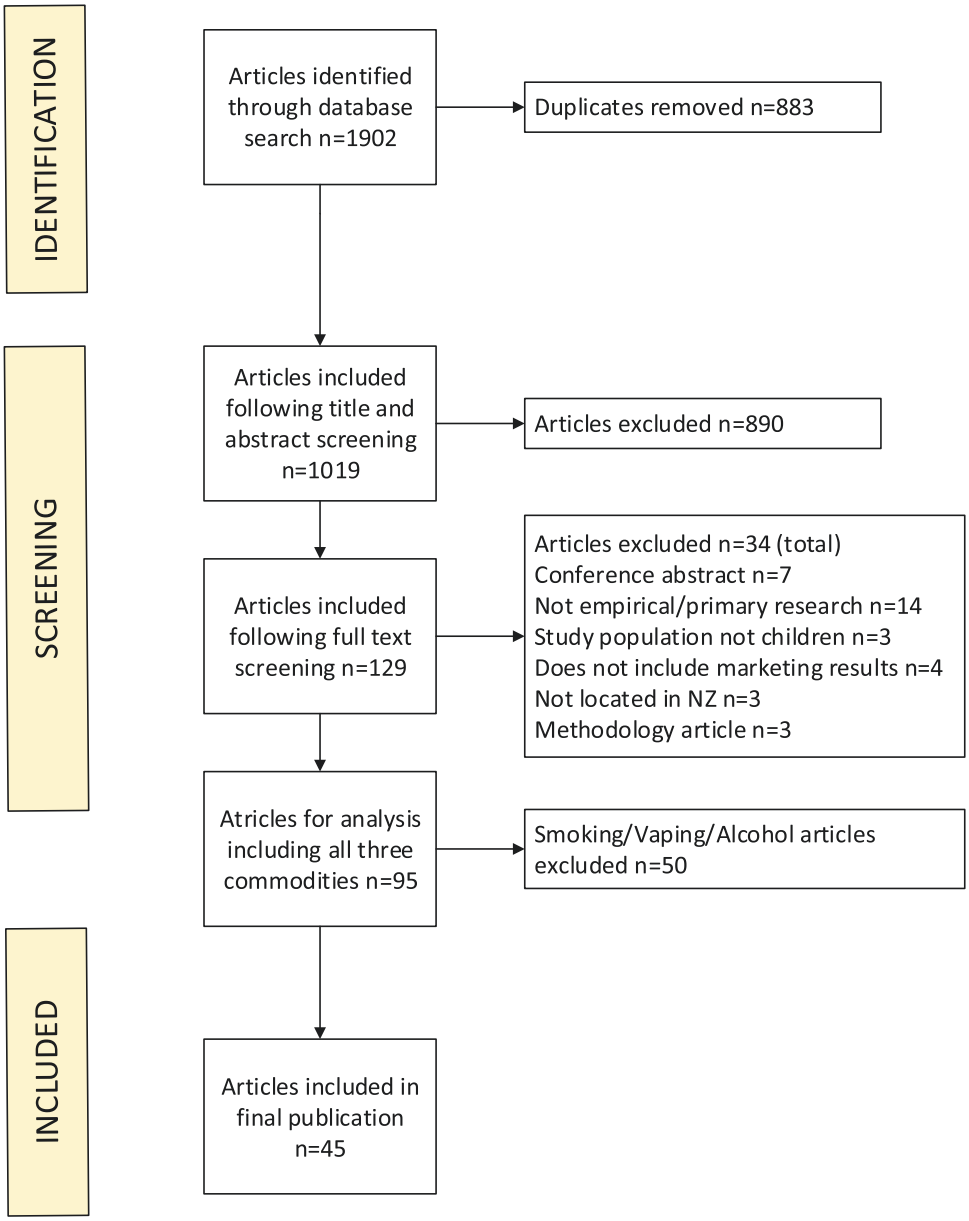

Figure 2. PRISMA.

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Table 1. Coding framework definitions and examples

Code	Definition	Example
Marketing exposure and power	Children. Exposure is the frequency and reach of the marketing messages and power is the creative content and strategies used	'A total of 3,693 advertisements were associated with these stores, equating to an average of 12.5 advertisements per retailer'. (Brien *et al.* 2023)
Marketing settings and mediums	Settings such as sports, schools, supermarkets, buses, etc. Mediums such as radio, tv, billboards, social media, product placement, friend/family endorsement, etc.	'Once prompted, most reported seeing food marketing in some or all of the places about which they were asked. These included at home, at school, at sports venues, while in the car or outdoors in public places, in shops and supermarkets, on the internet, on billboards and signs and, less often, in newspapers and magazines, and on the radio'. (Signal *et al.* 2019)
Product and brand awareness, preference, loyalty	Greater recall of brands; having a preferable brand choice. Increased loyalty children have to a brand and its overall product selection	'Food ads represented one-third of the favourites cited by the children in the survey. These covered a wide range of brands but centered on confectionery, fast foods and drinks'. (Marshall *et al.* 2007)
Source of acquisition	Marketing influencing the brand/product for: self-purchase, requesting caregiver to purchase or sourcing from friends/family, etc.	'In the focus groups, a number of the children talked about asking parents for things they saw advertised on television, but few felt their pestering would have any major impact on their parents' decision'. (Marshall *et al.* 2007)
Normalization	The products become a normal thing in society and the life course for children	'It is noteworthy, however, that more than 25% of all students reported that they usually have chocolates or soft drinks available at home'. (Utter *et al.* 2011)
Behaviour and consumption of unhealthy food drink	Children increasing the consumption of the product immediately and across their life course. Behaviours	'Journey breaks at food outlets contributed the highest percentage (36.0% of total journey breaks)' (Gage *et al.* 2023)
Risk factors and disease	Children become at risk of diseases or risk factors related to the product or have disease/risk factors caused by the product. Either now or in the future	'…overweight and overweight + obesity outcome categories exhibited significant associations with neighbourhood deprivation and access to food shops…'(Jenkin *et al.* 2015)

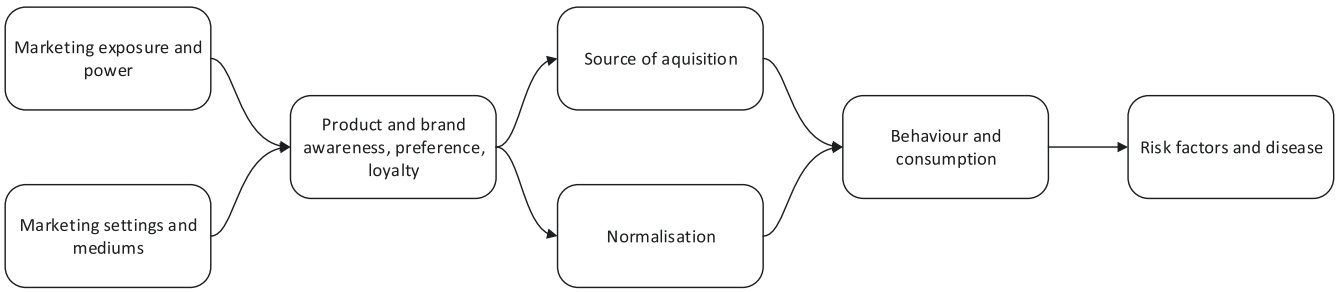

Figure 3. Coding framework.

Marketing exposure and power

Understanding children's exposure to unhealthy food and drink marketing in NZ encompasses the frequency and reach of the marketing messages and the power the creative content and strategies has on individuals' preferences. Understanding the exposure and power of unhealthy food and drink marketing in NZ could be used to inform evidence-based policies. Our review found that in NZ children are exposed to much greater marketing of unhealthy food and drinks (like sugar-sweetened beverages, chips, lollies, etc.) than the marketing of healthy products (fruits, yoghurt, etc.) (No et al. 2014, Signal et al. 2017, Liu et al. 2020, McKerchar et al. 2020). Liu et al. (2020) found that when children were in outdoor public places, they were exposed to an average of 8.3 food advertisements every hour, and nearly 90% of these were for unhealthy food and drink. Similarly, within a 500-m area surrounding schools in Auckland, 83.1% of marketing advertisements were for unhealthy food and drink (Kneller et al. 2024). Moreover, when children visited convenience stores, McKerchar et al. (2020) found the mean number of exposures per child to unhealthy food and drink marketing was 7.9 for packaging, 6.8 for signs, 4.2 for branded

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displays and 2.8 for price promotions. The KidsCam study in Wellington found that children were exposed to 27.3 marketing exposures per day for unhealthy food and drink and only 12.3 exposures per day for healthy food and drink (Signal et al. 2017). Exposure is not equally distributed with children living in neighbourhoods of deprivation being exposed to far greater marketing of unhealthy food and drink products than their peers in more well-off neighbourhoods (Vandevijvere et al. 2016, Egli et al. 2019, Huang et al. 2020, Brien et al. 2023).

Specific marketing techniques commonly used in NZ are cartoon characters (Vandevijvere et al. 2017, 2018, Kidd et al. 2021, Garton, Gerritsen et al. 2022), elite sport athletes (Vandevijvere, Aitken et al. 2018, Vandevijvere, Molloy et al. 2018, Brouwer 2022, Garton, Gerritsen et al. 2022), toy promotions (Signal et al. 2019), online advergaming (Vandevijvere, Sagar et al. 2017, Garton, Gerritsen et al. 2022), catchy songs/slogans (Signal et al. 2019) and television adverts during children's peak viewing times (Vandevijvere et al. 2017, Shen et al. 2022). An Australian study narrates how the persuasive power of marketing often centres on fun/happiness and fantasy/imagination (Hebden et al. 2011). Specific persuasive techniques like promotional characters, cartoons and celebrities work by attracting children's attention, improving memory, recognition and evoking feelings of positive attitudes towards the brand/product (Hebden et al. 2011).

Signal et al. (2019) demonstrated the link between marketing power and children's pestering, this is exemplified when children want a meal for the toy that accompanies it or when companies run competitions children often want the product so they can have a chance of winning. This is supported by the WHO, reporting that the use of these techniques, whether the company was intentionally targeting children or not; is appealing to children (World Health Organization 2023). The WHO (2023) guideline on food marketing, recommends government's implement mandatory policies that protect children from unhealthy food and drink marketing and restrict the power of food marketing persuasion (World Health Organization 2023). At present NZ does not have policies that align with these WHO recommendations. Specifically, NZ neglects to uphold the Children's Advertising Code principle of 'Social Responsibility' where unhealthy food and drink product marketing **must not** target children (Advertising Standards Authority 2024a).

Health promoters advocate for government policies to decrease the exposure or power of food marketing to children because developmentally children lack the critical thinking skills and scepticism to tell the difference between purposeful marketing and entertainment. This makes them more vulnerable to the effects of marketing than adults (Powell 2020, Rozendaal and Buijzen 2023). When Chile introduced laws that restricted marketing to children, not only was children's exposure reduced, adults benefited as well (Fretes et al. 2023). In NZ, there are no laws that restrict children's exposure to unhealthy food and drink marketing. Instead only industry-led, voluntary guidelines exist that are unregulated and unenforced (Advertising Standards Authority 2024b) leaving children open to all unencumbered influence from food and drink companies, both directly through unrestricted marketing and indirectly through lobbyists influencing government decisions (Hebden et al. 2011).

Marketing settings and mediums

Unhealthy food and drink marketing occurs in a wide range of settings, making it impossible for children to avoid exposure in their everyday lives. Our review found children's homes and schools to be the most prevalent place for unhealthy food and drink marketing exposure (Signal et al. 2017, Watkins et al. 2022). The environment around schools specifically, food outlets, convenience stores and bus stops are common settings for marketing unhealthy food and drink in NZ (Vandevijvere et al. 2016, Egli et al. 2019, Huang et al. 2020, Brien et al. 2023). Removing unhealthy food and drink marketing in and around schools would significantly reduce children's daily exposure. Modelling has also shown prohibiting unhealthy food and drink marketing at NZ's parks, recreation and sports facilities would also be an effective strategy to reduce children's overall levels of exposure (Liu et al. 2022).

Marketing of unhealthy food and drink in sport-related settings is particularly common in NZ (Carter et al. 2013, 2019, Brouwer 2022). This occurs through the sports children participated in themselves or watched at a live venue or on TV. The marketing mediums used at sporting venues and events were most commonly through sports sponsorship, player of the day certificates and through the food being sold at events (Carter et al. 2013, 2019, Brouwer 2022). Brouwer (2022) found that children had mixed feelings on unhealthy food and drink sponsorship in sports as some liked it, whereas others thought it controversial and believed healthy products should be associated with sports.

Other mediums include television advertisements (Utter et al. 2006, Marshall et al. 2007, Jenkin et al. 2009, Vandevijvere et al. 2017, Shen et al. 2022), packaged food (Signal et al. 2017, McKerchar et al. 2020, Watkins et al. 2022), posters/signage (Maher et al. 2005, Signal et al. 2017, 2019, Liu et al. 2022, Brien et al. 2023), and Facebook, Instagram and YouTube (Vandevijvere, Aitken et al. 2018, Gerritsen et al. 2021, Kidd et al. 2021, Garton, Gerritsen et al. 2022). Food packaging is what leads to homes being one of the most preventable places for unhealthy food and drink marketing (Signal et al. 2017). However, it is important to recognize that such changes are not easily implemented through legislation without further investigation into the possibility of plain packaging on unhealthy food and drink products, similar to the plain packaging that has occurred on research with tobacco products in NZ (Moodie et al. 2019). In lieu of plain packaging, enacting policies that restrict the marketing of unhealthy food and drink in public spaces is a feasible approach that would align with WHO recommendations on marketing practices.

Several overseas councils and governments have implemented restrictions on the marketing of unhealthy food and drink. The UK has just implemented a suite of measures banning unhealthy food and drink marketing to kids, including bans from TV before 9 pm and all online ads of foods high in sugar, fat and salt (Campbell 2024). This is in addition to bans on public transport that have been in place in London since 2019 (Yau *et al.*, 2022). Australia's Capital Territory placed restrictions on the promotion of unhealthy food and drink on public transport in 2015 (Chung et al. 2022) and the 2019 United Kingdom ban resulted in a reduction in purchasing of high-energy products within households (Yau et al. 2022).

While any mandatory and enforceable regulation to protect children from unhealthy food and drink marketing would be

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a welcome step in the right direction in NZ, regulation should be sufficiently comprehensive that it minimizes the risk of the marketing simply migrating from one setting to another. Companies are clever and can find other initiatives to promote their products. Legislation banning explicit marketing of tobacco, tobacco companies moved to product placement strategies in films or marketing alternative products displaying the tobacco companies' brand (Hoek 2004). The WHO guidelines recommend that policy is comprehensive so to restrict the effect of marketing migration from one medium or setting to another.

Product and brand awareness, preference and loyalty

This literature review showed that marketing of unhealthy food and drink leads to brand favouritism amongst children and an increased awareness of the products available by the preferred brands. Social media facilitates a digital environment where unhealthy food and drink companies can engage with children directly. This occurs directly by creating company accounts and indirectly through influencers, where children can like and interact with posts (Garton, Gerritsen et al. 2022, Mc Carthy et al. 2022). Vandevijvere et al. (2018) found the McDonalds and Coca-Cola Facebook pages had the highest potential reach amongst 13- to 18-year-olds in NZ. Furthermore, when children were asked what their favourite television advertisement was, Marshall et al. (2007) found a third of children liked food ads the most, with confectionary, fast food and drinks being clear favourites. Bollard et al. (2016) demonstrated that children had significantly less preference for products with plain packaging and warning labels and were significantly less likely to purchase these products over items with traditional branding. The literature demonstrates the need and effectiveness of reducing the appeal to children by making marketing and packaging less attractive. This may lead to improved dietary behaviours.

Earlier research has described how the profitable corporate company Coca-Cola, known globally for their typically unhealthy soda beverages, have created and infiltrated schools with education programs on nutrition and physical activity around the world. The free resources provided in the Singapore program are covered with the Coca-Cola logo (Powell and Gard 2015). As children see this in the classroom in association with healthy eating messaging, it is acceptable to believe that when they see the logo outside of the classroom, they are likely to accept the beverages as being healthy and acceptable to consume as part of their diet.

As product and brand awareness creates dietary preferences and consumer loyalty among children across the life course, policy needs to be implemented to break the chain from advertising > dietary preference > dietary behaviours > health outcomes. Dietary behaviours that are solidified in childhood are carried through to adulthood (Craigie et al. 2011) making clear the argument for NZ to implement policies focused on prevention that restrict marketing of unhealthy food and drink to children. And there is great support among children for these policies. When a class of NZ primary school children were asked what they would do if they were prime minister for a day, a common response from children was to 'ban junk food marketing to kids' (Signal et al. 2019).

Source of acquisition

It was found that children are sourcing unhealthy food and drink by either purchasing it themselves (Signal et al. 2019, McKerchar et al. 2020), pestering their caregivers (Marshall et al. 2007, Signal et al. 2019) or accessing through other sources such as being served it at early learning centres (McKelvie-Sebileau et al. 2022). One study found that nearly 95% of food and drink purchased at convenience stores by 10- to 13-year-olds is unhealthy, with confectionary being the most frequently purchased (McKerchar et al. 2020).

To reduce children's ability to self-purchase high sugar and caffeinated products, in 2019 the Woolworths supermarket chain introduced age restrictions for purchasing energy drinks, requiring customers to be ≥ 16 years (Woolworths n.d.). However, other retailers have not adopted similar voluntary measures, and the NZ government has not implemented supporting legislation. Without broader regulations, the Woolworths' age-restriction initiative may be perceived as 'health-washing' and is likely part of a suite of measures designed to increase preference and loyalty to the Woolworths brand (White et al. 2020). Health experts and school principals have asked the government to implement legislation that restricts the purchasing of energy drinks to children to reduce the associated negative health consequences of consumption specifically dental caries and the impact of caffeine on developing bodies and brains (Aldridge 2019, Northland Age 2022).

Easy access to unhealthy food outlets for children, makes it more compelling for children to purchase unhealthy food and drink themselves. Whanganui school principals retell that fast food outlets near schools are 'hot spots' for students to meet after school and are very busy whilst students are still in uniform (de Jong 2024). In the small NZ town, Tirau, an application has been made to open a Burger King and Starbucks Franchise neighbouring the Tirau Primary School on the main street (Martin 2024). The close proximity of fast food outlets and its marketing near schools increases the likelihood of students purchasing and thus consuming unhealthy food and drink. We need councils and the government to implement a policy to ban the development of new outlets near schools to protect our children.

Normalization

As children are increasingly exposed to the marketing of unhealthy food and beverages in their everyday lives, a normalization of consuming these products occurs. This normalization fosters a misconception that frequent consumption of such items is acceptable and without negative consequences. In sporting environments, the availability of unhealthy food and drinks at venues is widespread (Carter et al. 2019). Brouwer (2022) further emphasizes that younger children often observe teenagers at sports clubs consuming high-energy 'sports' drinks, leading them to believe that these products are essential for athletic performance.

Behaviour and consumption of marketed foods and drink

The aim of marketing is to influence the purchase of the product being marketed and thus increase sales and revenue for the company. When it comes to unhealthy food/drink this means the aim is to make people buy the product, consume it and keep consuming it.

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Inconclusive findings have been made on food outlet distance from home or school and dietary behaviour. Egli et al. (2020) and Jenkin et al. (2015) found there to be no significant association between unhealthy food outlet distance from children's schools or homes and unhealthy dietary behaviour. In contrast to what we would expect, Clark et al. (2014) found that children's diet quality index scores decreased (less healthy) with an increase in the distance of food outlets from schools. Nonetheless, when children visited convenience stores and made a purchase, researchers showed that all food and drink consumption was unhealthy food and/or drink (McKerchar et al. 2020). The last National Children's Nutrition Survey was conducted in 2002 on 5- to 14-year-olds who would now all be adults (Ministry of Health 2003). We do not know what the current generation of children are now eating over 15 years since this survey was undertaken.

Risk factors and disease

Of the studies included in our systematic search and subsequently reviewed, we found links between marketing exposure and dietary behaviours but no direct relationship between marketing exposure and disease outcomes. Modelling by Egli et al. (2020) showed poorer dietary behaviours were associated with greater body size of children in NZ but that unhealthy food outlets were unrelated to unhealthy dietary behaviours and excess body size. While not retrieved through our specific search strategy the connection between dietary behaviour and disease outcomes has been shown in other studies (Thornley et al. 2021, Dubois et al. 2022), supporting the chain of marketing exposure and associated patterns of disease as addressed by ASEAN (ASEAN & UNICEF 2023).

Strengths and limitations

A main strength of this review is that the framework identified the full range of marketing techniques of exposure, power, settings and mediums within the literature. This allowed the identification of how marketing is widely used and exposed to NZ children.

A methodological strength of this review is the inclusion of qualitative, quantitative and mixed-method studies. This allowed the capture of all the research that has been undertaken of marketing exposure to children in NZ as per the research question. The PRISMA guidelines were followed, and all studies included were medium to high quality.

A limitation of this review is the majority of the studies focused on large cities in NZ or national coverage. There is an opportunity for future research to focus on children's exposure in small rural towns away from big cities, where the exposure to marketing may differ, due to differences in food outlets, location to schools as well as time spent on screens. At present, children's exposure in small rural towns is only captured in the large national studies. Furthermore, some of the studies used the same datasets when publishing results, limiting the understanding of marketing exposure to children across the country. These were Egli et al. 2019, Egli, Hobbs et al. 2020, and Egli, Villanueva et al. 2020; and the results from the KidsCam study by Gage et al. 2023, Liu et al. 2020, 2022, McKerchar et al. 2020, Signal et al. 2017, 2019, and Watkins et al. 2022.

A consideration for future research is to analyse the differences in marketing exposure over time. This review included studies ranging from 1999 to 2023 and did not track changes. Marketing techniques and reach are expected to change with trends and technology.

Our key recommendations to policymakers and practitioners are:

- Ban the use of cartoon characters on unhealthy food and beverage packaging;
- Ban unhealthy food and drink companies from sponsoring sports events and sports teams;
- Limit how children are able to see unhealthy food and drink marketing through digital marketing and social media;
- Ban unhealthy food and drink marketing surrounding schools and on buses and trains.

This review echoes calls of health experts and Health Coalition Aotearoa that the Government needs to implement enforceable, mandatory legislation to protect children from the harms of unhealthy food and drink marketing (Health Coalition Aotearoa 2023, Public Health Advisory Committee 2024). Addressing the root causes of marketing exposure and interrupting the link between such exposure and negative health outcomes will result in improved public health and reduce the likelihood of children developing poor dietary habits that persist into adulthood. Failing to implement preventive legislation will allow large corporate food and beverage companies to continue influencing children's consumption patterns, fostering unhealthy dietary behaviours that carry into later life and contributing to the rising incidence of non-communicable diseases.

CONCLUSION

Unhealthy food and drink advertising is ubiquitous, persuasive and children are exposed daily through various mediums. The results from this review showed the main settings children are exposed to are inside their homes and at school on digital platforms and packaged goods, followed by in neighbourhoods where children live play and learn via food outlets, convenience stores and bus stops. To improve the health of NZ's children now and in the future policy action is urgently needed to protect children from exposure to this unhealthy food and drink marketing.

SUPPLEMENTARY MATERIAL

Supplementary material is available at *Health Promotion International* online.

AUTHOR CONTRIBUTIONS

V.E. conceptualized the study design with input from L.T.M., S.M. and C.M. H.F. drafted the research protocol, conducted the literature search. V.E., S.M., C.M. and L.T.M. provided guidance on article inclusion/exclusion. H.F. took the lead on screening, analysis, coding, quality appraisal with input, support and guidance from V.E. H.F. and V.E. wrote the first draft of the manuscript with revision, input and feedback provided by L.T.M., S.M. and C.M.

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CONFLICT OF INTEREST

None declared.

DATA AVAILABILITY

The data are available from the corresponding author upon request.

The section of the journal for which the submission is intended: Children and Young People's Health

REFERENCES

Advertising Standards Authority. *Advertising standards code. Advertising standards authority*. 2024a. https://www.asa.co.nz/codes/codes/advertising-standards-code/ (15 September 2024, date last accessed).

Advertising Standards Authority. *Childrens's advertising code. Advertising standards authority*. 2024b. https://www.asa.co.nz/codes/codes/childrens-advertising-code/ (15 September 2024, date last accessed).

Advertising Standards Authority. *Food and beverage advertising code. Advertising Standards Authority*. 2024c. https://www.asa.co.nz/codes/codes/food-and-beverage-advertising-code/ (24 October 2024, date last accessed).

Aldridge K. *Calls for more retailers to ban sale of energy drinks to those under 16. 1News*. 2019. https://www.1news.co.nz/2019/09/02/calls-for-more-retailers-to-ban-sale-of-energy-drinks-to-those-under-16/ (5 September 2024, date last accessed).

ASEAN & UNICEF. *Minimum standards and guidelines on actions to protect children from the harmful impact of marketing of food and non-alcoholic beverages in the ASEAN region*. 2023. https://asean.org/book/asean-minimum-standards-and-guidelines-on-actions-to-protect-children-from-the-harmful-impact-of-marketing-of-food-and-non-alcoholic-beverages/ (4 August 2024, date last accessed).

Bach K and Manton DJ. Early childhood caries: a New Zealand perspective. *J Prim Health Care* 2014;**6**:169–74.

Bollard T, Maubach N, Walker N *et al*. Effects of plain packaging, warning labels, and taxes on young people's predicted sugar-sweetened beverage preferences: an experimental study. *Int J Behav Nutri Physical Act* 2016;**13**:95. https://doi.org/10.1186/s12966-016-0421-7

Brien A, Wu S, Maharaj S *et al*. Junk food, sugary drinks and XL portion sizes: advertising on convenience stores near primary schools in Tāmaki Makaurau Auckland, Aotearoa New Zealand. *Kōtuitui: New Zealand J Soc Sci Online* 2023;**18**:45–63. https://doi.org/10.1080/1177083x.2022.2058407

Brouwer E. *Utilising junior participant and caregiver perceptions to understand food and beverage sponsorship of sport*. Master's thesis, Massey University, 2022. http://hdl.handle.net/10179/18088

Brown K. Association between alcohol sports sponsorship and consumption: a systematic review. *Alcohol Alcohol* 2016;**51**:747–55. https://doi.org/10.1093/alcalc/agw006

Buckland G, Northstone K, Emmett PM *et al*. Associations of childhood diet quality scores with arterial stiffness and carotid artery intima-media thickness in adolescence/early adulthood: findings from the ALSPAC cohort. *Br J Nutr* 2024;**131**:720–35. https://doi.org/10.1017/S0007114523002763

Cairns G, Angus K, Hastings G. *The Extent, Nature and Effects of Food Promotion to Children: A Review of the Evidence to December 2008*. Switzerland: World Health Organization, 2009. https://iris.who.int/handle/10665/44237

Cairns G, Angus K, Hastings G *et al*. Systematic reviews of the evidence on the nature, extent and effects of food marketing to children. A retrospective summary. *Appetite* 2013;**62**:209–15. https://doi.org/10.1016/j.appet.2012.04.017

Campbell D. Junk food TV ads to be banned pre-watershed in UK from October 2025. Guardian. 12 September 2024. https://www.theguardian.com/politics/2024/sep/12/junk-food-tv-ads-to-be-banned-pre-watershed-in-uk-from-october-2025

Carter M, Signal L, Edwards R *et al*. Food, fizzy, and football: promoting unhealthy food and beverages through sport—a New Zealand case study. *BMC Public Health* 2013;**13**:126. https://doi.org/10.1186/1471-2458-13-126

Carter M, Signal L, Edwards R *et al*. Competing teammates: food in New Zealand sports settings. *Health Promot Int* 2019;**34**:803–10. https://doi.org/10.1093/heapro/day035

Carter M-A, Edwards R, Signal L *et al*. Availability and marketing of food and beverages to children through sports settings: a systematic review. *Public Health Nutr* 2012;**15**:1373–9. https://doi.org/10.1017/S136898001100320X

Chapple S, Anderson T. Grease or sand in the wheels of democracy? The market for lobbying in New Zealand. *Policy Quart* 2018;**14**:10–7.

Chung A, Zorbas C, Riesenberg D *et al*. Policies to restrict unhealthy food and beverage advertising in outdoor spaces and on publicly owned assets: a scoping review of the literature. *Obesity Rev* 2022;**23**:e13386. https://doi.org/10.1111/obr.13386

Clark EM, Quigg R, Wong JE *et al*. Is the food environment surrounding schools associated with the diet quality of adolescents in Otago, New Zealand? *Health Place* 2014;**30**:78–85. https://doi.org/10.1016/j.healthplace.2014.08.008

Coppell KJ, Mann JI, Williams SM *et al*. Prevalence of diagnosed and undiagnosed diabetes and prediabetes in New Zealand: findings from the 2008/09 adult nutrition survey. *N Z Med J* 2013;**126**:23–42.

Craigie AM, Lake AA, Kelly SA *et al*. Tracking of obesity-related behaviours from childhood to adulthood: a systematic review. *Maturitas* 2011;**70**:266–84. https://doi.org/10.1016/j.maturitas.2011.08.005

de Jong E. *Concern Over Students Flocking to Fast Food Outlets after School. Whanganui Chronicle NZ Herald*. 2024. https://www.nzherald.co.nz/whanganui-chronicle/news/close-proximity-of-fast-food-outlets-proving-difficult-for-whanganui-schools/F57PLPLR65CFLGYMNKKAPWWPNE/ (5 September 2024, date last accessed).

Dubois L, Bédard B, Goulet D *et al*. Eating behaviors, dietary patterns and weight status in emerging adulthood and longitudinal associations with eating behaviors in early childhood. *Int J Behav Nutr Phys Act* 2022;**19**:139. https://doi.org/10.1186/s12966-022-01376-z

Egli V, Hobbs M, Carlson J *et al*. Deprivation matters: understanding associations between neighbourhood deprivation, unhealthy food outlets, unhealthy dietary behaviours and child body size using structural equation modelling. *J Epidemiol Community Health* 2020;**74**:460–6. https://doi.org/10.1136/jech-2019-213159

Egli V, Sing F, Mackay S *et al*. *NZ Falling Behind on International Rules to Protect Kids from Food Marketing. The Briefing: Public Health Communication Centre*. 2023. https://www.phcc.org.nz/briefing/nz-falling-behind-international-rules-protect-kids-food-marketing (24 October 2024, date last accessed).

Downloaded from https://academic.oup.com/heapro/article/40/2/daaf021/8104713 by Massey University user on 16 May 2025

Egli V, Villanueva K, Donnellan N *et al*. Understanding children's neighbourhood destinations: presenting the Kids-PoND framework. *Children's Geograph* 2020;**18**:420–34. https://doi.org/10.1080/14733285.2019.1646889

Egli V, Zinn C, Mackay L *et al*. Viewing obesogenic advertising in children's neighbourhoods using google street view. *Geograph Res* 2019;**57**:84–97. https://doi.org/10.1111/1745-5871.12291

Ejtahed H-S, Mardi P, Hejrani B *et al*. Association between junk food consumption and mental health problems in adults: a systematic review and meta-analysis. *BMC Psychiatry* 2024;**24**:438. https://doi.org/10.1186/s12888-024-05889-8

Encyclopedia Britannica. *New Zealand*. *Britannica*. 6 September 2024. https://www.britannica.com/place/New-Zealand (9 September 2024, date last accessed).

Espiner G. *Lobbyists in New Zealand enjoy freedoms unlike most other nations in the developed world. Radio New Zealand*. 25 March 2023. https://www.rnz.co.nz/news/lobbying/486670/lobbyists-in-new-zealand-enjoy-freedoms-unlike-most-other-nations-in-the-developed-world (15 September 2024, date last accessed).

Fretes G, Corvalán C, Reyes M *et al*. Changes in children's and adolescents' dietary intake after the implementation of Chile's law of food labeling, advertising and sales in schools: a longitudinal study. *Inter J Behav Nutri Phys Act* 2023;**20**:40.

Frost H. *Advertising 101: marketing unhealthy commodities to children: a systematic review*. 2024. https://doi.org/10.17605/OSF.IO/SHB9T (2 August 2024, date last accessed).

Gage R, Gurtner M, Keall M *et al*. Fun, food and friends: a wearable camera analysis of children's school journeys. *J Transp Health* 2023;**30**:101604. https://doi.org/10.1016/j.jth.2023.101604

Garton K, Gerritsen S, Sing F *et al*. Unhealthy food and beverage marketing to children on digital platforms in Aotearoa, New Zealand. *BMC Public Health* 2022;**22**:2407. https://doi.org/10.1186/s12889-022-14790-6

Garton K, Mackay S, Sing F *et al*. Unhealthy food and drink marketing in Aotearoa New Zealand: Evidence Snapshot 2022. 2022.https://doi.org/10.17608/k6.auckland.19105496.v1 (24 October 2024, date last accessed).

General Assembly resolution 44/25. *Convention on the Rights of the Child. Office of the High Commissioner for Human Rights*. 1989. https://www.ohchr.org/en/instruments-mechanisms/instruments/convention-rights-child (6 January 2025, date last accessed).

Gerritsen S, Sing F, Lin K *et al*. The timing, nature and extent of social media marketing by unhealthy food and drinks brands during the COVID-19 pandemic in New Zealand. *Front Nutri* 2021;**8**:645349. https://doi.org/10.3389/fnut.2021.645349

Health Coalition Aotearoa. *2023 Annual Report and AGM*: *Better Health, Fairer Outcomes, Protected Children*. 2023 (30 August 2024, date last accessed).

Hebden L, King L, Kelly B. Art of persuasion: an analysis of techniques used to market foods to children. *J Paediatr Child Health* 2011;**47**:776–82. https://doi.org/10.1111/j.1440-1754.2011.02025.x

Hoek J. Tobacco promotion restrictions: ironies and unintended consequences. *J Bus Res* 2004;**57**:1250–7. https://doi.org/10.1016/s0148-2963(02)00449-6

Honicky M, Cardoso SM, Kunradi Vieira FG *et al*. Ultra-processed food intake is associated with children and adolescents with congenital heart disease clustered by high cardiovascular risk factors. *Br J Nutr* 2022;**129**:1163–71. https://doi.org/10.1017/s0007114522002240

Huang D, Brien A, Omari L *et al*. Bus stops near schools advertising junk food and sugary drinks. *Nutrients* 2020;**12**:1192. https://doi.org/10.3390/nu12041192

The Integrity Institute. *Lobbying Corrupts Decisions*. 2023. The Integrity Institute. https://theintegrityinstitute.org.nz/lobbying-corrupts-decisions/ (9 September 2024, date last accessed).

Isaksen IM, Dankel SN. Ultra-processed food consumption and cancer risk: a systematic review and meta-analysis. *Clin Nutri* 2023;**42**:919–28. https://doi.org/10.1016/j.clnu.2023.03.018

Jenkin G, Pearson A, Bentham G *et al*. Neighbourhood influences on children's weight-related behaviours and body mass index. *Aims Public Health* 2015;**2**:501–15. https://doi.org/10.3934/publichealth.2015.3.501

Jenkin G, Wilson N, Hermanson N. Identifying 'unhealthy' food advertising on television: a case study applying the UK Nutrient Profile model. *Public Health Nutr* 2009;**12**:614–23. https://doi.org/10.1017/S1368980008003029

Kidd B, Mackay S, Swinburn B *et al*. AdHealth: a feasibility study to measure digital food marketing to adolescents through Facebook. *Public Health Nutr* 2021;**24**:215–22. https://doi.org/10.1017/S1368980020001561

Kneller K, Garton K, Exeter DJ *et al*. Mapping the extent of unhealthy food advertising around schools in Tāmaki Makaurau/Auckland. *Kōtuitui: New Zealand J Soc Sci Online* 2024;**20**:65–82. https://doi.org/10.1080/1177083x.2024.2344510

Liu W, Barr M, Pearson AL *et al*. Space-time analysis of unhealthy food advertising: New Zealand children's exposure and health policy options. *Health Promot Int* 2020;**35**:812–20. https://doi.org/10.1093/heapro/daz083

Liu W, Gage R, Park H *et al*. The distribution of harmful product marketing in public outdoor spaces and the effectiveness of marketing bans. *Health Place* 2022;**76**:102861. https://doi.org/10.1016/j.healthplace.2022.102861

Maher A, Wilson N, Signal L. Advertising and availability of 'obesogenic' foods around New Zealand secondary schools: a pilot study. *N Z Med J* 2005;**118**(1218): U1556. http://www.nzma.org.nz/journal/118-1218/1556 PT - Article

Marshall D, O'Donohoe S, Kline S. Families, food, and pester power: beyond the blame game? *J Cons Behav* 2007;**6**:164–81. https://doi.org/10.1002/cb.217

Martin M. Fast food bunfight brews for Tīrau. Waikato Times. 2024. https://www.waikatotimes.co.nz/nz-news/350328771/fast-food-bunfight-brews-tirau

Mc Carthy CM, de Vries R, Mackenbach JD. The influence of unhealthy food and beverage marketing through social media and advergaming on diet-related outcomes in children-a systematic review. *Obesity Rev* 2022;**23**:e13441. https://doi.org/10.1111/obr.13441

McKelvie-Sebileau P, D'Souza E, Tipene-Leach D *et al*. Healthy food environments in early learning services: an analysis of manager survey responses, menus and policies in regional New Zealand early childhood education and care centres. *Int J Environ Res Public Health* 2022;**19**:4709. https://doi.org/10.3390/ijerph19084709

McKerchar C, Smith M, Gage R *et al*. Kids in a candy store: an objective analysis of children's interactions with food in convenience stores. *Nutrients* 2020;**12**:2143–14. https://doi.org/10.3390/nu12072143

Minister of Health. *Government Policy Statement on Health 2024–2027*. Ministry of Health, 2024. https://www.health.govt.nz/publications/government-policy-statement-on-health-2024-2027

Ministry of Health. *NZ Food NZ Children: Key Results of the 2002 National Children's Nutrition Survey*. Wellington NZ: Ministry of Health, 2003.

Moodie C, Hoek J, Scheffels J *et al*. Plain packaging: legislative differences in Australia, France, the UK, New Zealand and Norway, and options for strengthening regulations. *Tob Control* 2019;**28**:485–92. https://doi.org/10.1136/tobaccocontrol-2018-054483

No E, Kelly B, Devi A *et al*. Food references and marketing in popular magazines for children and adolescents in New Zealand: a content analysis. *Appetite* 2014;**83**:75–81. https://doi.org/10.1016/j.appet.2014.08.013

Northland Age. *Principal's Plea Highlights Need for Regulation of Energy Drinks. Norhtland Age NZ Herald*. 2022. https://www.nzherald.co.nz/northland-age/news/principals-plea-highlights-need-for-regulation-of-energy-drinks/N6M4JP3T5IQOMBSFAMCSZO5TAI/ (5 September 2024, date last accessed).

Park S, Lee Y, Lee JH. Association between energy drink intake, sleep, stress, and suicidality in Korean adolescents: energy drink use in isolation or in combination with junk food consumption. *Nutr J* 2016;**15**:87. https://doi.org/10.1186/s12937-016-0204-7

Downloaded from https://academic.oup.com/heapro/article/40/2/daaf021/8104713 by Massey University user on 16 May 2025

Pechmann C, Levine L, Loughlin S *et al*. Impulsive and self-conscious: adolescents' vulnerability to advertising and promotion. *J Public Policy Market* 2005;**24**:202–21. https://doi.org/10.1509/jppm.2005.24.2.202

Powell D. Harmful marketing to children. *Lancet (London, England)* 2020;**396**:1734–5. https://doi.org/10.1016/S0140-6736(20)32403-X

Powell D, Gard M. The governmentality of childhood obesity: Coca-Cola, public health and primary schools. *Discourse* 2015;**36**:854–67. https://doi.org/10.1080/01596306.2014.905045

Public Health Advisory Committee. *Rebalancing Our Food Systems*. Wellington NZ: Ministry of Health, 2024.

Robertson L, Cameron C, McGee R *et al*. Point-of-sale tobacco promotion and youth smoking: a meta-analysis. *Tob Control* 2016;**25**:e83–9. https://doi.org/10.1136/tobaccocontrol-2015-052586

Rozendaal E, Buijzen M. Children's vulnerability to advertising: an overview of four decades of research (1980s–2020s). *Inter J Advert* 2023;**42**:78–86. https://doi.org/10.1080/02650487.2022.2135349

Sallis JF, Owen N. Ecological models of health behavior. In: Glanz K, Rimer BK., Viswanath KV. (eds.), *Health Behavior: Theory, Research, and Practice*. 5th edn. Hoboken, NJ: Jossey-Bass/Wiley, 2015, 43–64.

Shah SS, Noman O, Jaiswal N. Unveiling the xut. *Cureus* 2023;**15**:e49179. https://doi.org/10.7759/cureus.49179

Shen S, Mackay S, Lee A *et al*. Impact of a voluntary industry code for advertising food to children and young people: an analysis of New Zealand television data. *Public Health Nutr* 2022;**25**:1384–94. https://doi.org/10.1017/s1368980021004705

Signal LN, Jenkin GLS, Barr MB *et al*. Prime minister for a day: children's views on junk food marketing and what to do about it. *N Z Med J* 2019;**132**:36–45.

Signal LN, Stanley J, Smith M *et al*. Children's everyday exposure to food marketing: an objective analysis using wearable cameras. *Inter J Behav Nutri Phys Activ* 2017;**14**:137. https://doi.org/10.1186/s12966-017-0570-3

Sing F, Mackay S, Culpin A *et al*. Food advertising to children in New Zealand: a critical review of the performance of a self-regulatory complaints system using a public health law framework. *Nutrients* 2020;**12**:1278. https://doi.org/10.3390/nu12051278

Stats NZ. *Population Stats NZ*. StatsNZ Tataranga Aotearoa, 2024. https://www.stats.govt.nz/topics/population (24 October 2024, date last accessed).

Thornley L, Signal L, Thomson G. Does industry regulation of food advertising protect child rights? *Crit Public Health* 2010;**20**:25–33. https://doi.org/10.1080/09581590802566461

Thornley S, Bach K, Bird A *et al*. What factors are associated with early childhood dental caries? A longitudinal study of the Growing Up in New Zealand cohort. *Int J Paediatr Dent* 2021;**31**:351–60. https://doi.org/10.1111/ipd.12686

Utter J, Scragg R, Schaaf D. Associations between television viewing and consumption of commonly advertised foods among New Zealand children and young adolescents. *Public Health Nutr* 2006;**9**:606–12. https://doi.org/10.1079/phn2005899

Vandevijvere S, Aitken C, Swinburn B. Volume, nature and potential impact of advertisements on Facebook and YouTube by food brands popular in New Zealand. *N Z Med J* 2018;**131**:14–24.

Vandevijvere S, Molloy J, Hassen de Medeiros N *et al*. Unhealthy food marketing around New Zealand schools: a national study. *Int J Public Health* 2018;**63**:1099–107. https://doi.org/10.1007/s00038-018-1158-7

Vandevijvere S, Sagar K, Kelly B *et al*. Unhealthy food marketing to New Zealand children and adolescents through the internet. *N Z Med J* 2017;**130**:32–43.

Vandevijvere S, Soupen A, Swinburn B. Unhealthy food advertising directed to children on New Zealand television: extent, nature, impact and policy implications. *Public Health Nutr* 2017;**20**:3029–40. https://doi.org/10.1017/S1368980017000775

Vandevijvere S, Sushil Z, Exeter DJ *et al*. Obesogenic retail food environments around New Zealand schools: a national study. *Am J Prev Med* 2016;**51**:e57–66. https://doi.org/10.1016/j.amepre.2016.03.013

Watkins L, Gage R, Smith M *et al*. An objective assessment of children's exposure to brand marketing in New Zealand (Kids'Cam): a cross-sectional study. *Lancet Planet Health* 2022;**6**:e132–8. https://doi.org/10.1016/S2542-5196(21)00290-4

White M, Aguirre E, Finegood DT *et al*. What role should the commercial food system play in promoting health through better diet? *BMJ (Clinical Research Ed.)* 2020;**368**:m545. https://doi.org/10.1136/bmj.m545

Woolworths. *Woolworths Energy Drinks*. Woolworths NZ Ltd. n.d. Retrieved 2 September 2024, from https://www.woolworths.co.nz

World Health Organization. *Policies to Protect Children from the Harmful Impact of Food Marketing: WHO Guideline*. World Health Organization, 2023. https://www.who.int/publications/i/item/9789240075412

Yau A, Berger N, Law C *et al*. Changes in household food and drink purchases following restrictions on the advertisement of high fat, salt, and sugar products across the Transport for London network: a controlled interrupted time series analysis. *PLoS Med* 2022;**19**:e1003915. https://doi.org/10.1371/journal.pmed.1003915

Downloaded from https://academic.oup.com/heapro/article/40/2/daaf021/8104713 by Massey University user on 16 May 2025