Sugary drink advertising expenditure across Australian media channels 2016–2018

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Abstract

Objective: The aim of this study was to describe advertising expenditure for sugary drinks compared with alternative cold non-alcoholic beverages (artificially sweetened beverages, plain water, plain milk) between 2016 and 2018 across Australian media channels.

Methods: Monthly estimates of advertising expenditure for non-alcoholic beverages were obtained from Nielsen Media and aggregated by product type and media.

Results: Total sugary drink advertising expenditure between 2016 and 2018 ($129.5M) significantly exceeded expenditure on artificially sweetened drinks ($23.26M), plain water ($14.27M), and plain milk ($31.30M). Television and out-of-home advertising accounted for the largest share of sugary drink advertising (45%, 35%). Expenditure on out-of-home advertising was more heavily dominated by sugary drinks (75%) than advertising in all media combined (65%). Sugary drink advertising peaked in warmer months and was lowest in August. Soft drinks (26%), flavoured milks (24%) and energy drinks (21%) accounted for the majority of sugary drink advertising.

Conclusions: Cold non-alcoholic beverage advertising in Australian media is dominated by the advertising of sugary drinks.

Implications for public health: Restricting unhealthy beverage advertising on television and out-of-home media may be most effective initially. However, comprehensive restrictions capturing a broader range of media and settings would be optimal to prevent displacement and limit advertising reach and exposure.

Key words: sugary drinks, advertising, mass media, television, out-of-home

In 2018, rates of overweight and obesity in Australia reached 67% in adults and 25% in children and adolescents, increasing the risk of type 2 diabetes, heart disease and 13 types of cancer.[1,2] Sugary drinks, including those high in added or naturally occurring sugar, provide energy in liquid form that is poorly compensated for in the diet.[3] Accordingly, frequent consumption of sugary drinks is a leading behavioural risk factor for weight gain and is also directly linked to an increased risk of some cancers, type 2 diabetes and dental caries.[4-7] It is, therefore, a cause for concern that sugar-sweetened beverages are commonly consumed in excess and are some of the most heavily marketed food or beverage products in Australia.[8-11]

Unhealthy food and drink advertising influences children and adolescents' preferences, requests and consumption.[12-14] Although direct evidence for its influence on adults is more equivocal, marketing of unhealthy food to children has been identified as a causal factor in weight gain and obesity.[13-18] The World Health Organization has declared restricting the marketing of unhealthy, energy-dense nutrient-poor food and drink a global priority for obesity prevention,[19] but regulations on food and drink marketing in Australia are still limited in scope and impact. For example, the Children's Television Standards prohibit certain advertising techniques and misleading nutrition claims during designated 'children's' free-to-air television programming.[20] However, the standards do not restrict overall exposure and do not apply to prime-time programming, when children and families comprise a large proportion of viewership. Industry-regulated codes are similarly limited and are not adequately monitored or sanctioned.[20,21] For example, there was no change in the rates of unhealthy food advertising on Sydney television between 2006 and 2015, despite industry initiatives introduced in 2009 to limit the advertising of unhealthy products to children by food, beverage and fast-food restaurant companies.[22-24] Further, signatories to these initiatives advertise unhealthy foods at a higher or at least comparable rate to non-signatories,[24,25] indicating the ineffectiveness of the current regulatory system that serves industry interests and does not yet have public health as a key objective or independent monitoring of adherence to standards.[26] As with research on the influence of advertising, marketing controls primarily relate to concerns about children's exposure. Given the concerning rates of overweight and obesity among Australians of all ages, it is of interest to broaden the focus of research to examine unhealthy product marketing across

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a range of media and settings that are used and frequented by children, adolescents and adults.

Television has long been the dominant advertising medium for unhealthy food and drink.[27] However, while overall expenditure on television advertising has been in decline in Australia since at least 2011, out-of-home advertising (for example, billboards, street furniture and shopping centre advertisements) and digital advertising have shown the largest growth of all media in recent years, which is projected to continue.[28] Digital advertising offers new avenues to reach consumers in an engaging, interactive and more personalised manner.[29] However, neither monitoring nor controls of digital advertising are as well established as those of traditional media.[29,30] Like television, out-of-home food and drink advertising in Australia is dominated by unhealthy products. In 2016, 84% of all food and drink advertising across the Sydney metropolitan train network was for unhealthy items.[31] Unhealthy food and drinks also dominate the advertising landscape surrounding primary schools and popular school routes in NSW.[32,33]

Research to date has quantified the frequency, duration or potential reach of unhealthy food and drink advertising on Australian media (television, out-of-home) using standardised counts or industry-standard metrics (target audience rating points [TARPs]). Estimates of advertising expenditure permit comparison between media channels and, to our knowledge, have not yet been applied in this area in Australia. The aim of the present study is to estimate expenditure on the advertising of sugary drinks across Australian media channels (television, newspapers, magazines, radio, out-of-home, cinema, digital) between 2016 and 2018. For context, we make comparisons with expenditure on alternative cold beverages: artificially sweetened beverages, plain water and plain milk. Given current policy interest, we examine estimates of out-of-home advertising expenditure alone as well as providing estimates across other media channels.

Methods

Advertising expenditure data

Estimates of monthly advertising expenditure for all non-alcoholic beverages in Australia were obtained from Nielsen Media Ad Intel service for 2016, 2017 and 2018. Nielsen Media Ad Intel is a commercial service that tracks advertising and estimates media spend across a range of platforms in markets around the world. A combination of platform-provided media logs, in-house and third-party automated and manual monitoring methods is used. Advertising for a range of products and services is monitored, but Nielsen provided only non-alcoholic beverage advertising spend for the purpose of this project. Expenditure estimates were provided for the following media channels using the methods and for the regions listed below. Data were supplied in the format of expenditure estimates by brand and product, per month, per media and per region monitored.

Free-to-air television

Advertising expenditure was estimated from visual monitoring of television output and program logs from free-to-air television stations from six metropolitan (Sydney, Melbourne, Brisbane, Adelaide and Perth) and six regional markets (regional areas of Victoria, Western Australia, Queensland, New South Wales [including Canberra] and all of Northern Territory and Tasmania). Advertiser discounts were applied (such that discounts were provided for purchases of a larger number of advertising spots, providing better value for money). Estimates did not include appearances of products in program content, live discussions of products (paid or unpaid), or appearance of products or brand imagery in sports broadcasts (e.g. visible in footage of sports arena).

Newspapers

Advertising was monitored by visual verification of physical newspaper publications by Nielsen Media. Display and classified ads ≥10cm^2 in metropolitan (all capital cities) and national newspapers were included. Display ads ≥40cm^2 in major regional newspapers (in all states and territories except South Australia and Western Australia) were included but classified ads were not. Advertising spend was estimated based on the size, position and colour of the advertisement and applied advertiser discounts.

Magazines

Weekly and monthly magazines with high national circulation (approximately 140 titles) were monitored by visual verification of the publication. Advertising inserts in magazines were not included, but newspaper insert magazines were. Advertising spend was estimated based on the size, position, and colour of the advertisement and applied advertiser discounts.

Radio

The daily station logs of main metropolitan commercial radio stations in five capital cities (Sydney, Melbourne, Brisbane, Adelaide and Perth) were monitored. Estimates only included paid advertisement spots, including 'live reads' of paid advertisements but not live discussions of products within programs (paid or unpaid) or program sponsorship. Advertising rate cards and station logs were received from media owners and advertiser discounts applied.

Out-of-home

Out-of-home advertising expenditure was estimated from advertising rate cards and logs received from major agencies responsible for advertising in shopping centres, public transit (vehicles and stations), street furniture, billboards, posters and mobile formats in all states and territories except for Northern Territory. Advertising in sporting arenas or promotional activities in public spaces (e.g. product giveaways) is not monitored by Nielsen Media Ad Intel. Advertiser discounts were applied.

Cinema

Advertising expenditure in metropolitan and regional cinemas (excluding stills advertising) was estimated via airtime logs from Val Morgan, the company responsible for advertising in virtually all Australian cinemas. Advertising rate cards and logs were received from media owners and advertiser discounts were applied.

Digital

Advertising material displayed on 1,900+ selected websites was monitored at a national level via Pathmatics service. A core list of monitored sites was determined based on the 'top sites' according to monthly page views as collected by Nielsen Digital Audience Measurement service. New sites are added to the 'crawl' list as requested by subscribers and removed if they are later determined not to contain advertisements, only contain those irrelevant to the Australian market, or serve a high volume of junk advertisements. Pathmatics uses an automated web crawler to collect all advertising (excluding

advertisements on social media, smartphone apps, programmatic web display and video [content programmed to appear in response to users' search history], post-login, and paid or unpaid product appearances embedded in social media content). Brand and product names were assigned based on landing page metadata supplied by Pathmatics. Nielsen Media strips any advertisements captured that are not relevant to the Australian market or are determined to be 'junk' (i.e. adult or malicious content). Spend estimates were calculated based on average cost per thousand ($) × impression volume (calculated using page view data from Nielsen's digital audience measurement).

Data processing

The supplied advertising expenditure data were classified by the authors using brand and product names into minor product categories nested within major beverage categories, across media channels. Products were classified by one author (MC) and verified by a second (AH) according to agreed product definitions constructed in consultation with a dietitian (AM, see Supplementary Materials). A web search of the product name was conducted to verify the nutrition content where required, and the manufacturer was contacted if the required information was not accessible online. The four major beverage categories were: a) sugary drinks (with added sugar or naturally occurring sugar, including minor product categories such as soft, energy or sports drinks, flavoured milks with added sugar, 100% fruit juice, fruit-flavoured drinks, 'tonics' [e.g., 'Vitaminwater'], iced tea, kombucha, non-alcoholic beer and wine); b) artificially sweetened drinks (alternatives to 'sugary drinks' that contain artificial or intense [non-nutritive] sweeteners); c) plain water (still or sparkling); and d) plain milk (dairy or plant-based). Flavoured powders and liquids to be added to cold milk or water during preparation (e.g. chocolate milk powder, cordial) were included. Instant coffee, tea bags, protein powders and supplements, infant/toddler formula, detox and weight loss drinks, cooking ingredients (e.g. condensed milk) and probiotic shots were not included.

Total advertising expenditure for all regions was combined into a single national estimate and aggregated by media channel, major beverage category and month. Prices were adjusted to 2018 Australian dollars using the Consumer Price Index to account for inflation and to show real changes in expenditure over time.[34]

Analysis

Within each major beverage category, regression analyses were conducted to compare average monthly expenditure in 2017 and 2018 with 2016 for: a) for all media combined and b) out-of-home advertising only. Within sugary drinks, regression analyses were used to: a) examine the difference in monthly expenditure within each media channel in 2017 and 2018 relative to 2016; and b) compare expenditure between media channels. Regression analyses were also conducted to compare advertising expenditure between minor product categories representing different types of sugary drinks in 2017 and 2018 relative to 2016 for: a) all media combined and b) out-of-home advertising only, and to examine seasonality in expenditure. All analyses were conducted in STATA 16.[35]

Results

All media: sugary drinks versus alternatives

Total advertising expenditure in 2018 dollars for sugary drinks over 2016–2018 was $129.46M (*m*=$43.15M/year), compared to a total of $23.26M for artificially sweetened alternatives (*m*=$7.75M/year), $14.27M for plain water (*m*=$4.76M/year) and $31.30M for plain milk (*m*=$10.43M/year). On average, monthly expenditure on sugary drink advertising was 5.6 times higher than artificially sweetened drinks, 9.1 times higher than plain water and 4.1 times higher than plain milk (Figure 1a). Sugary drink advertising made up 65% of the average monthly expenditure for non-alcoholic cold drinks across the monitoring period (range 62–68%/year), with an additional 12% on average (range 9–14%/year) made up by artificially sweetened drinks (Table 1). Mean monthly advertising expenditure, after adjusting for inflation, for sugary drinks was not significantly different in 2017 (p=0.57) or 2018 (p=0.08) compared to 2016, and advertising in each alternative major beverage category also remained stable (all comparisons with 2016 p>0.07).

Sugary drink advertising across media channels

Advertising expenditure for sugary drinks between 2016 and 2018 was highest for television (monthly *m*=$1.62M), followed by out-of-home (monthly *m*=$1.25M,

Figure 1: Mean monthly advertising expenditure by major beverage category 2016-2018 ('000s, $2018AUD).

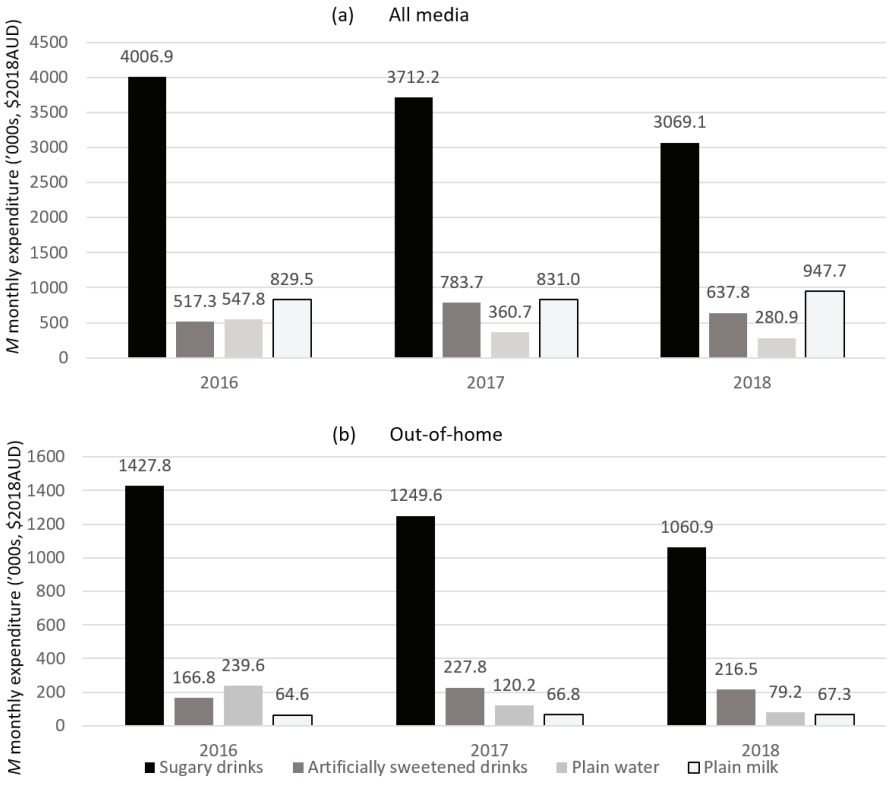


Table 1). Average monthly TV sugary drink advertising expenditure significantly exceeded expenditure in each other media channel each year (all $p<0.001$) except for out-of-home, which did not significantly differ from television in 2016 ($p=0.18$), but was significantly lower in 2017 ($p=0.01$) and 2018 ($p=0.004$, Table S4, Supplementary Materials). Television made up an average of 45% (range 43–48%/year) of all sugary drink advertising expenditure, and out-of-home made up 35% (range 34–36%/year). Cinema advertising comprised an average of 11% (range 10–13%/year) of sugary drink expenditure, and magazines, radio, digital and newspaper each made up <1–4% on average. Average monthly expenditure for sugary drinks in radio ($p=0.03$) and digital advertising ($p=0.01$) were each significantly lower in 2018 than in 2016, but expenditure in all other channels remained stable (all $p>0.10$).

Out-of-home advertising: sugary drinks versus alternatives

Expenditure on out-of-home advertising was consistently higher for sugary drinks (monthly $m=\$1.25M$) than for alternative non-alcoholic cold drink products (monthly m: artificially sweetened drinks=\$0.20M, plain water=\$0.15M, plain milk=\$0.07M, Figure 1b). On average, monthly expenditure on out-of-home advertising for sugary drinks was 6.1 times higher than for artificially sweetened drinks, 8.5 times higher than for plain water, and 18.8 times higher than for plain milk. Advertising for sugary drinks made up 75% of average monthly out-of-home advertising expenditure for non-alcoholic cold drinks, with an additional 12% attributable to artificially sweetened drinks (range 9–15%/year). Compared to 2016, mean monthly out-of-home advertising expenditure for sugary drinks did not significantly differ in 2017 ($p=0.60$) or 2018 ($p=0.28$). Out-of-home advertising expenditure for artificially sweetened drinks, plain water and plain milk each remained stable (all $p>0.06$).

Seasonal variation in sugary drinks advertising expenditure

On average, sugary drink advertising expenditure peaked between February and April, and October and December (corresponding with the start and end of summer) and declined from April to August where expenditure was lowest (Figure 2).

All media: sugary drink types advertised

For all media combined, the highest proportion of advertising expenditure within sugary drinks was for sugar-sweetened soft drinks (26% of sugary drink advertising 2016–2018) and flavoured milks (24%), followed by energy drinks (21%, Table S4, Supplementary Materials). Soft drinks consistently accounted for the largest share in each year, while energy drinks increased from 15% in 2016 to 24% in 2018. Sports drinks accounted for an average of 12% of expenditure, and fruit juice accounted for 2% in each year. The remainder of sugary drink advertising expenditure was attributable to flavoured water, tonics, fruit drinks and cordials, iced tea and kombucha, and non-alcoholic beer and wine combined ($m=14\%$). In dollar value, average monthly advertising expenditure for each type of sugary drink remained stable across 2016–2018 (all $p>0.07$).

Out-of-home media: Sugary drink types advertised

In out-of-home media alone, soft drinks accounted for the largest share of sugary drink advertising expenditure in 2016 and 2017 (29%, 25%, respectively), while flavoured milks and energy drinks accounted for the largest share of spend in 2018 (each 29%, up from 19% [flavoured milks], and 7% [energy drinks] in 2016, Table S5, Supplementary Materials). Sports drinks accounted for an average of 23% of out-of-home expenditure in 2016 and 8% in 2018, while fruit juice accounted for an average of 3% of out-of-home advertising spend between 2016 and 2018. In dollar value, average monthly out-of-home advertising expenditure for each type of sugary drink remained stable (all $p>0.05$) except for sports drinks, which was significantly lower in 2018 than 2016 ($p=0.006$).

Discussion

Advertising expenditure for sugary drinks far exceeded that for alternative cold beverages including artificially sweetened beverages, plain water and plain milk in Australian media between 2016 and 2018. This pattern was consistent across the period and indicates that the Australian food and drink marketing environment is at odds with the World Health Organization recommendation that free sugar consumption be limited to small amounts.[36] Adding to previous evidence, the findings suggest that the current self-regulatory framework is ineffective. Regulatory reform with meaningful public health objectives involving government intervention is needed to ensure the Australian media landscape is more supportive of public health. It is also important to note that the present advertising expenditure estimates are conservative due to poor coverage of digital and sports sponsorship expenditure.

The skew of advertising expenditure toward sugary drinks relative to alternatives was more pronounced in out-of-home advertising than in all media combined. This adds to previous research in selected Australian cities and internationally showing the heavy emphasis on unhealthy food and drinks in outdoor advertising.[31,37-39] Out-of-home advertising of sugary drinks is of particular

Table 1: Mean monthly advertising expenditure per major beverage category across 2016-2018. Values are $'000s 2018 AU and percentages are of the total spend per media channel (rows add to 100% with rounding).

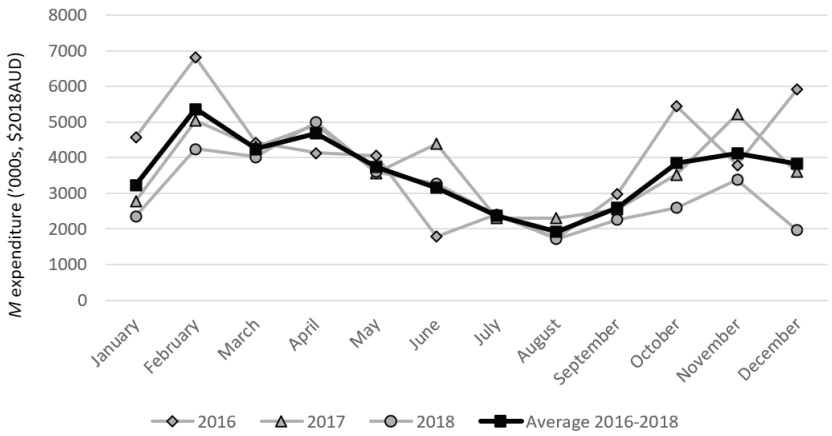
	Sugary drinks			Artificially sweetened drinks			Plain water			Plain milk		
	m	sd	%	m	sd	%	m	sd	%	m	sd	%
Television	1,616.2	677.0	58	356.8	246.5	13	174.4	362.7	6	661.8	419.6	24
Out-of-home	1,246.1	813.6	75	203.7	236.0	12	146.3	208.6	9	66.3	49.8	4
Cinema	410.7	220.7	92	11.2	38.0	2	20.2	46.5	5	4.4	10.0	1
Newspapers	40.6	51.6	67	7.3	25.3	12	6.8	11.2	11	5.7	12.1	9
Radio	144.7	98.0	58	0.4	2.2	0	23.4	33.9	9	83.0	102.8	33
Digital	110.1	96.6	64	15.5	34.9	9	7.9	17.1	5	39.4	29.5	23
Magazines	27.6	22.4	26	51.4	61.5	49	17.6	19.1	17	8.7	13.6	8
All media	3,596.0	1,279.8	65	646.2	359.6	12	396.5	439.2	7	869.4	478.3	16

concern, given that it is difficult for people to avoid. It also targets individuals when they are physically closer to outlets where these products are typically purchased and may therefore encourage unplanned impulse purchases.[40,41] Restrictions on unhealthy advertising were proposed for Queensland government-owned or leased property (e.g. public transport, billboards) but faced opposition from the advertising industry and are yet to be implemented.[42] Similar restrictions have however been implemented on public buses and light rail in Canberra but have not been evaluated in terms of health or economic impacts.[43] The nation-wide estimates in the present study support similar action in other jurisdictions.

In response to threats to profits posed by increasing marketing and labelling regulations and growing public awareness of the health effects of sugary drinks, industry groups have voiced a commitment to reducing sugar content across product ranges and to preferentially promote lower-sugar products.[44,45] However, the present findings show that spending on sugary drink advertising still vastly outweighed that for artificially sweetened drinks. Notwithstanding this imbalance, there is evidence that regular consumption of artificial sweeteners heightens mortality, and diabetes and cardiovascular risk.[46,47] Consumption of non-nutritive sweeteners may disrupt peripheral appetite signalling and contribute to weight gain over time, although evidence for a link with weight gain is also equivocal.[47-49] Advertising expenditure for artificially sweetened drinks was higher than for plain water (although this difference was smaller in magnitude than the difference between sugary and alternative drinks). A challenge for regulators will be to devise objective evidence-based criteria for classifying products as 'healthy' and 'unhealthy' and should consider the risks posed by artificially sweetened drinks as well as sugary drinks. Accordingly, scrutiny of industry activity (including sales, advertising as well as other public communications) should distinguish between artificially sweetened drinks and plain water where possible, given their different nutritional qualities and possible health effects.[49]

The findings also have implications for public health campaigns to discourage sugary drink consumption or to counter industry advertising. We found that advertising expenditure for sugary drinks was highest

Figure 2: Mean monthly sugary drink advertising expenditure by month (all media, '000s, $2018AUD).



in warmer months, and lowest at the end of winter. This is similar to the seasonality observed in unhealthy food advertising on Australian TV[11] and may reflect beverage companies capitalising on people's greater need for hydration at higher temperatures and accompanying consumer responsiveness to beverage adverts.[50] The most heavily promoted products in out-of-home advertising and across all media according to the present study were sugar-sweetened soft drinks, flavoured milks and energy drinks (which increased between 2016 and 2018 following an increase in sales).[51] For maximum impact, public health campaigns might feature messages targeting these products and scheduling to correspond with peaks in advertising of sugary drinks and other non-core food products. Sugary drink advertising expenditure in Australia over 2016–2018 totalled at least $129M in 2018 dollars. The public needs to be informed about the health risks of a poor diet; this should also help to build support for government policies,[52,53] as demonstrated in response to sugary drink focused public health campaigns in South Africa[54] and Australia.[55] Increasing investment in high-reach multi-media public health campaigns is therefore timely and important. However, as public health campaigns cannot match the investment in advertising by industry, ultimately, further restrictions on unhealthy product advertising on a range of platforms are needed.

Strengths of this study include that products were coded according to a systematic protocol developed in conjunction with a dietitian. Previous research has provided estimates of the duration or frequency of potential advertising exposure and targeting of specific groups. In contrast, estimates of sugary drink advertising expenditure from the present study do not speak to the reach or exposure among the Australian population, but instead depict the enormous scale of the endeavour and provide the first insights into how beverage industry advertising budgets may be allocated across media channels. It will be important to consider a range of complementary approaches to ongoing monitoring to form a coherent view of the advertising landscape in Australia.

The scope of this study is limited by the lack of coverage of some forms of promotional activity. Estimates of advertising via sports sponsorship (including integrated advertising in match broadcasts as well as on player uniforms, equipment and stadiums) were not available, but represent a source of considerable brand visibility, which promotes increased brand awareness and preference for sponsored products.[56-58] Promotional giveaways in public spaces and product placements in broadcast media or social media content were also not included. While the digital spend was estimated to make up between 2% and 4% of sugary drink advertising, it is important to note that estimates of social media or programmatic advertising (personalised to user search history) spend were not available. Advertising industry insights suggest that digital advertising spend in fact exceeded TV in Australia in 2018.[28] Therefore, it will be important to re-evaluate expenditure on digital marketing of unhealthy food and drink as more comprehensive monitoring becomes accessible, although this will be hampered by the breadth and rapid evolution of this

type of marketing. Nonetheless, monitoring digital marketing is especially pertinent given the frequent use of multiple social media platforms among Australian adolescents who are responsive to advertising in these channels and are also some of the heaviest consumers of sugary drinks.[53,59-62]

Imposing higher regulatory standards to meaningfully reduce the marketing of unhealthy products via out-of-home media and TV is likely to be most impactful in the first instance, given the clear evidence for the dominance of unhealthy product advertising in these channels. However, comprehensive restrictions will be needed to prevent the diversion of advertising investment into still-permitted media and settings, with vigilance to emerging forms of digital advertising.

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Supporting Information

Additional supporting information may be found in the online version of this article:

Supplementary Table 1: Sugary drink product definitions.

Supplementary Table 2: Alternative beverage definitions.

Supplementary Table 3: Ineligible drink product definitions (excluded from expenditure estimates).

Supplementary Table 4: Sugary drink advertising expenditure per media channel and per sugary drink type. Values are $'000s 2018 AU and percentages are of the total sugary drink ad spend in each year (columns in each panel add to 100% with rounding).

Supplementary Table 5: Sugary drink advertising expenditure in out of home media per sugary drink product type. Values are $'000s 2018 AU and percentages are of the out of home sugary drink ad spend in each year (columns in each panel add to 100% with rounding).