

# Monitoring changes in community support for policies on obesity prevention

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Overweight and obesity rates continue to rise in Australia with 2017–18 figures showing 67% of the adult population and 24.9% of children aged 5–17 years overweight or obese.<sup>1</sup> Overweight and obesity contributed 8.4% of the total burden of disease (DALY; disability-adjusted life years) experienced by Australians in 2015, second only to tobacco use as a preventable risk factor and contributing to a range of disease group burdens including endocrine, kidney and cardiovascular diseases and cancer.<sup>2</sup> Knowledge and information about how to follow obesity prevention recommendations are not enough to enable sustainable changes in behaviour and need to be provided within an environment that promotes healthy diets.<sup>3</sup> Governments have a responsibility to use public health policy through regulations and guidelines to create a health-enabling environment.<sup>4</sup>

In Australia, a report on obesity prevention by the National Preventative Health Taskforce had recommendations to create a health-enabling environment, including: to reduce exposure of children and others to marketing, advertising, promotion and sponsorship of energy-dense nutrient-poor foods and beverages; to increase the availability and demand for healthier food products, and decrease the availability and demand for unhealthy food products through the introduction of food labelling on front of pack and menus to support healthier food choices; and to use pricing and incentives to promote production, access to and consumption of healthier foods.<sup>5</sup> A recent evidence check found improved labelling, increasing the price

## Abstract

**Objective:** To investigate the New South Wales (NSW) community's support for obesity prevention policies and concern for food marketing and promotion issues, and to determine any demographic differences or changes over time.

**Methods:** In 2013 (n=2474), 2016 (n=1602) and 2019 (n=1613) a sample of adults who were representative of the NSW population for age, gender, education and location was asked about support for policy initiatives that influence the food environment. Analysis identified the characteristics of those who supported policies and variation in support over time.

**Results:** There were limited changes in support over time; however, support for many policies was strong and sustained. In 2019, support was highest for regulation of claims about nutrition (77.2%), and health warning labels (75.7%). Support for a ban on unhealthy food advertising that targets children (64.6%) had decreased since 2013. Women, older people and those who were aware that obesity was a risk factor for cancer were generally more likely to support policies. Parents were more likely than non-parents to be concerned about positioning unhealthy food at supermarket checkouts (OR 1.32) and unhealthy outdoor advertisements (OR 1.22). Concern increased in 2019 for unhealthy marketing on the internet (OR 1.21).

**Conclusions:** This study shows public support for policy options at moderate to high levels but not increasing in the six-year study period.

**Implications for public health:** These results form part of a package that, along with the well-established evidence, makes the case for policy action in Australia.

**Key words:** community support, food environments, food marketing, food policy, health star rating

of unhealthy foods, implementing advertising restrictions and developing school policies were effective obesity prevention interventions.<sup>6</sup>

In countries where regulation has been implemented, there is evidence of effectiveness. In Chile, since 2016, products carrying a warning sign indicating high energy, saturated fat, sodium or sugar content have been restricted from being marketed directly to children.<sup>7</sup> Post-implementation, there has been a decrease in the use of child-directed strategies on breakfast cereal packages<sup>8</sup> and a decrease in

exposure of pre-schoolers and adolescents to child-directed marketing on television.<sup>9</sup> Several countries have introduced taxes on sugar-sweetened beverages (SSBs). Following the implementation of a tax of one peso/litre on SSBs in Mexico in 2014, there has been a reduction in the observed purchases of SSBs and an increase in water purchases.<sup>10</sup> These changes have been sustained over two years and found to be most effective in households at the lowest socioeconomic level.<sup>11</sup> Since the announcement in 2016 of a soft drink industry levy in the United Kingdom, sales of soft drinks subject to the levy fell by 50%.<sup>12</sup>

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There has been limited uptake of government-led policy in Australia since the Taskforce recommendations in 2009.<sup>5,13</sup> Food marketing to children in Australia is primarily addressed by industry-led self-regulatory initiatives that have been shown not to reduce the extent of unhealthy food advertising on television<sup>14,15</sup> and public transport.<sup>16,17</sup> There are no levies or subsidies on food in Australia besides fresh, unprocessed food being exempt from the Goods and Services Tax (GST), presently 10%.<sup>18</sup> In 2014, the Australian and New Zealand Governments worked with public health, consumer and industry groups to introduce the Health Star Rating on packaged food as a standardised way to help consumers compare the nutritional profile of similar packaged foods.<sup>19</sup> The Health Star Rating is a voluntary system, with Australian data showing 30% of eligible products displayed some form of the system after four years in the market.<sup>20</sup>

Addressing the obesogenic environment requires policy actions by Governments supported by industry and civil society.<sup>21</sup> The policy preference of voters, the 'public will', plays a role in influencing 'political will'.<sup>22</sup> Community demand for change can be used as a lever for government action.<sup>23,24</sup> The extent of public support for obesity prevention policies helps inform advocacy efforts and identifies community priorities for policy actions. That is particularly relevant in 2021 in Australia as a long-term National Preventive Health Strategy is being developed alongside a National Obesity Strategy.<sup>25</sup>

This study follows community support for obesity prevention policies at three time points over six years to investigate if policy support is changing. It aims to: 1) investigate the New South Wales (NSW) community's support for obesity prevention policies and concern for a range of food marketing and promotion issues; 2) determine any demographic differences; and 3) determine any changes over time.

## Methods

### Study sample and data collection

In 2019, New South Wales adults were recruited through a market research company's database to participate in a 20-minute online survey measuring knowledge of cancer risk factors and support for policy areas to address cancer prevention.

Participants were recruited through an email invitation to 63,000 members of an online panel. Participants received incentives in line with panel guidelines, either earning reward points that could later be redeemed for gift vouchers or entering a monthly prize giveaway. After an initial 'pilot' period of data collection, some minor refinements were made to the survey prior to the main data collection. The 51 surveys completed during the pilot were not included in the final dataset. While the survey was in the field, age, gender, location and education profile of respondents was monitored against the New South Wales population profile on these variables to obtain representative quotas. Participants were screened out if they were currently undergoing treatment for cancer or were employed in advertising or the sale or manufacture of alcohol or tobacco. Participants were randomly allocated to two of four topic streams on behaviours and attitudes to policy initiatives: nutrition and healthy eating, alcohol, smoking, and sun protection. Similar surveys were conducted in 2013 and 2016 and are described elsewhere.<sup>26,27</sup> This study was approved by the Cancer Council NSW Ethics Committee.

### Survey

The survey included demographic characteristics: age (years); gender (male; female; other/prefer not to say); location (Sydney and suburbs; other NSW); education attained (school up to year 12; diploma or certificate; university-qualified; prefer not to say); and whether participants had dependent children aged <18 years. Body mass index (BMI) was calculated from self-reported weight and height. Participants were asked four questions, randomly presented to investigate prompted awareness of the link between four health risk factors (being inactive or spending too much time sitting, not eating enough fruit or vegetables, being overweight or obese, drinking too much alcohol) and six health conditions (cancer, heart disease, type 2 diabetes, high cholesterol, being overweight and obese, liver disease). A response of 'cancer' to the question 'Which of the following do you think can result from being overweight or obese?' was used in this analysis to determine if there was a relationship between knowledge of cancer risk and support for obesity-related food policy.

To investigate food policy support, participants were asked to indicate on a

five-point scale ('strongly agree', 'agree', 'neither agree nor disagree', 'disagree', 'strongly disagree', along with a 'don't know' option) their answer to the question 'To what extent would you support or oppose each of the following?' as they were presented with each policy initiative (question details in Table 2). To further capture details of the community appetite for different aspects of food marketing policy, concern about the extent of food marketing in a range of media was measured (question details in Table 3).

### Data analysis

The final survey sample was weighted according to Australian Bureau of Statistics population estimates to ensure the sample was representative of the New South Wales adult population for age, gender, education and location (Sydney vs. other NSW) based on the 2016 census.<sup>28</sup> Postcode was used to allocate to quintiles of Index of Relative Socio-economic Disadvantage (IRSD) with a low score indicating relatively greater disadvantage, also based on the 2016 census.<sup>29</sup> BMI was categorised into underweight or normal weight (<25.0 kg/m<sup>2</sup>) and overweight or obese (≥25.0 kg/m<sup>2</sup>). Age was categorised into 18 to 39 years, 40 to 59 years, and 60 years and over.

Support for policy options was dichotomised into 'support' (strongly support/support) or 'do not support' (neither support nor oppose/oppose/strongly oppose). In the case of the food marketing policy options, responses were dichotomised into 'concerned' (somewhat concerned/very concerned) or 'not concerned'. Those who selected 'don't know' were excluded from the analysis. The weighted proportion of participants who supported policies to address obesity and who were concerned about food and drink marketing to children in each Cancer Prevention Community Survey from 2013 to 2019 was calculated.

Multivariable logistic regression analyses were carried out to identify characteristics (age, sex, IRSD, BMI, knowledge of overweight and obesity as a risk factor for cancer, and year of survey) of those supportive of policy options and those concerned about food and drink marketing to children. For concern about food and drink marketing to children, the 2016 and 2019 surveys were used as the main analysis (with the additional covariate of parental status); due to only participants who were parents being asked questions about concern in the 2013 survey, all three surveys

were combined as a sensitivity analysis restricting to parents only. The significance level for the analyses was set at 0.05. IBM SPSS Statistics Subscription Build 1.0.0-3581.m and SAS 9.4 were used for analyses.

## Results

Of the 5,767 participants who clicked on the survey link in 2019, 3,264 (56%) completed the survey and 1,613 completed the nutrition topic stream of the survey. The number of participants who completed the nutrition topic stream in 2016 and 2013 was 1,602 and 2,474, respectively. Sample characteristics are shown in Table 1. New South Wales statistics report 55.2% of adults were overweight or obese in 2019<sup>30</sup> compared with 47.8% in this survey, although 13.6% did not answer that question.

### Understanding of link between overweight and obesity and cancer risk

In 2019, a higher proportion of participants indicated that cancer was linked to overweight and obesity (43.7%) compared with 39.5% in 2013 and 38.2% in 2016 (Table 1).

### Support for food policies to address obesity

In 2019, the most supported policies were those for food labelling including regulation of claims about nutrition (77.2%), health warning labels (75.7%) and mandating the Health Star Rating (71.3%), see Table 2. The advertising and promotion initiative that was the most supported was a ban on unhealthy food advertising that targets children (64.6%). Within fiscal policy, a government subsidy of fresh fruit and vegetables (67.9%) had more support than a health levy on sugary drinks (47.8%) and a tax or increasing the price on unhealthy foods (44.2% and 40.6%), see Table 2. The policies with the highest proportion of those opposed were the tax/levy policies (26–32%), the removal of sugar-sweetened drinks from government settings (24%) and a ban on unhealthy food and drink advertising on government-owned property (15%), while all other policies had proportions opposing  $\leq 11\%$  (results not shown).

Support for policies to address obesity by sociodemographic characteristics, BMI, knowledge of obesity as a risk factor for cancer and each survey year is shown in Table 3.

**Table 1: Sample characteristics for those who answered the nutrition section of the questionnaire in each Cancer Prevention Community Survey from 2013 to 2019 (unweighted).**

		2013 (n=2,474)	2016 (n=1,602)	2019 (n=1,613)
		%	%	%
Age group	18-39	36.1	34.8	39.9
	40-59	39.1	39.1	31.2
	60 and over	24.8	26.2	28.9
Gender	Male	49.1	46.9	47.3
	Female	50.9	52.8	52.5
	Other/prefer not to say	0.0	0.2	0.2
Location	Sydney and suburbs	63.5	62.8	68.1
	Other NSW	36.5	37.2	31.9
Education	School up to year 12	31.5	26.4	35.6
	Diploma or certificate	37.2	39.0	30.9
	University qualified	31.3	33.9	32.6
	Prefer not to say	0.0	0.7	1.9
Quintile for Index of Relative Socio-Economic Disadvantage 2016 (derived from postcode)	Lowest Quintile (most disadvantaged)	15.6	18.1	13.1
	Second Quintile	18.5	19.2	18.4
	Third Quintile	21.8	21.6	19.4
	Fourth Quintile	14.8	15.5	16.6
	Highest Quintile (least disadvantaged)	29.3	25.3	32.4
	Missing	0.0	0.3	0.2
Have children aged <18 years		34.2	33.8	28.0
BMI	$\leq 25$	34.5	31.0	38.6
	$>25$	50.3	45.8	47.8
	Not answered	15.2	23.2	13.6
Knowledge of obesity as a cancer risk factor <sup>a</sup>	Yes	39.5	38.2	43.7
	No	33.3	38.9	32.1
	Don't know	27.2	22.9	24.2

Note:

a: weighted data

**Table 2: Weighted proportion (%) of participants who supported/strongly supported policy in each Cancer Prevention Community Survey from 2013 to 2019.**

	2013	2016	2019
<b>Food labelling</b>			
Regulation that prevents unhealthy foods from having claims on their labels about nutrients or healthiness (e.g. marshmallows promoted as low in fat).		72.3 <sup>a</sup>	77.2 <sup>a</sup>
The display of health warning labels on unhealthy foods	78.1 <sup>a</sup>	73.9 <sup>a</sup>	75.7 <sup>a</sup>
Health Star Ratings are useful to help people choose healthier packaged foods and drinks		68.8 <sup>a</sup>	71.7 <sup>a</sup>
Regulation that makes it mandatory for all packaged foods and drinks to carry a Health Star Rating		70.4 <sup>a</sup>	71.3 <sup>a</sup>
<b>Food marketing and promotion</b>			
A ban on unhealthy food advertising that targets children	72.5 <sup>a</sup>	63.2 <sup>a</sup>	64.6
Supermarkets having a healthy checkout policy where only healthy food is positioned and advertised at checkouts			58.2
A ban on unhealthy food and drink advertising on government owned property (e.g. buses, trains, and along main highways) to protect children			55.9
The removal of sugar sweetened drinks from government settings such as railway platforms and stadiums			43.7
<b>Fiscal policy</b>			
The government subsidising fresh fruit and vegetables so they cost less			67.9
Increased government funding of public media campaigns about healthy eating			57.4
A health levy on sugary drinks to pay for programs to educate people on healthy eating and the cost of diet-related health problems			47.8
A tax on unhealthy foods to pay for programs to educate people on healthy eating <sup>b</sup> and pay for the cost of diet-related health problems <sup>c</sup>	40.4 <sup>b</sup> /39.7 <sup>a</sup>	37.9 <sup>b</sup> /41.2 <sup>a</sup>	44.2
Increasing the price of unhealthy foods to discourage people from consuming them	39.8 <sup>a</sup>	39.2 <sup>a</sup>	40.6

Notes:

a: Survey question worded as "How strongly/to what extent do you agree or disagree with each of the following statements?" (Strongly agree/agree shown).

b, c: This question was divided into two questions in 2013 and 2016, bQ1 and cQ2.

Weights based on ABS population estimates for age, gender, education and location.

**Table 3: Support for regulation by sociodemographic characteristics, BMI and knowledge of obesity as a risk factor for cancer in the 2013, 2016 and 2019 Cancer Prevention Community Surveys.**

Characteristic	OR for support (95% CI)									
	Food labelling			Food marketing and promotion				Food marketing and promotion		
	Regulation that prevents unhealthy foods from having claims on their labels about nutrients or healthiness (e.g. marshmallows promoted as low in fat)	The display of health warning labels on unhealthy foods	Health Star Ratings are useful to help people choose healthier packaged foods and drinks	Regulation that makes it mandatory for all packaged foods and drinks to carry a Health Star Rating	A ban on unhealthy food advertising that targets children	Supermarkets having a healthy checkout policy where only healthy food is positioned and advertised at checkouts	A ban on unhealthy food and drink advertising on government owned property (e.g. buses, trains, and along main highways) to protect children	The removal of sugar sweetened drinks from government settings such as railway platforms and stadiums		
<b>Sex</b>										
Men <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Women	1.34 (1.12–1.61)*	1.35 (1.18–1.54)*	1.30 (1.10–1.53)*	1.24 (1.06–1.46)*	1.25 (1.11–1.42)*	1.51 (1.22–1.88)*	1.35 (1.09–1.68)*	1.15 (0.93–1.42)		
<b>Age group</b>										
18–39 years <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40–59 years	1.48 (1.20–1.82)*	1.42 (1.22–1.66)*	1.32 (1.10–1.59)*	1.07 (0.88–1.29)	1.28 (1.12–1.47)*	0.95 (0.74–1.22)	1.09 (0.85–1.40)	0.87 (0.67–1.11)		
≥60 years	2.10 (1.63–2.70)*	1.92 (1.60–2.31)*	1.85 (1.48–2.31)*	1.36 (1.09–1.70)*	2.36 (1.99–2.79)*	1.63 (1.23–2.16)*	2.14 (1.62–2.82)*	1.59 (1.22–2.08)*		
<b>IRSD quintile</b>										
Lowest (most disadvantaged) <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Second	1.23 (0.92–1.64)	0.95 (0.76–1.18)	1.02 (0.78–1.33)	1.09 (0.84–1.42)	0.85 (0.69–1.04)	1.19 (0.82–1.74)	1.25 (0.86–1.83)	1.35 (0.92–1.96)		
Third	1.21 (0.92–1.61)	1.05 (0.85–1.30)	1.38 (1.06–1.81)*	1.53 (1.17–2.00)*	0.99 (0.81–1.21)	1.29 (0.88–1.88)	1.17 (0.80–1.69)	1.46 (1.00–2.12)*		
Fourth	1.66 (1.21–2.27)*	1.21 (0.96–1.53)	1.10 (0.83–1.45)	1.38 (1.04–1.82)*	1.01 (0.82–1.25)	1.13 (0.76–1.66)	1.07 (0.73–1.57)	1.75 (1.19–2.58)*		
Highest	1.52 (1.16–2.00)*	1.24 (1.01–1.52)*	1.26 (0.99–1.62)	1.49 (1.16–1.90)*	1.02 (0.85–1.24)	1.24 (0.88–1.75)	1.22 (0.87–1.72)	1.69 (1.20–2.39)*		
<b>Parent of children aged &lt;18 years</b>										
No <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.06 (0.87–1.29)	0.92 (0.76–1.12)	1.19 (0.99–1.42)	1.03 (0.86–1.24)	1.20 (1.01–1.43)*	1.07 (0.83–1.37)	1.22 (0.95–1.55)	1.29 (1.01–1.64)*		
<b>BMI</b>										
≤25 kgm <sup>-2b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
>25 kgm <sup>-2</sup>	0.82 (0.66–1.01)	0.86 (0.73–1.00)*	1.00 (0.83–1.21)	1.04 (0.87–1.26)	1.05 (0.92–1.21)	0.99 (0.78–1.26)	1.02 (0.80–1.29)	0.95 (0.76–1.19)		
Not answered	0.63 (0.49–0.81)*	0.52 (0.43–0.62)*	0.74 (0.59–0.93)*	0.69 (0.55–0.87)*	0.66 (0.56–0.79)*	0.60 (0.43–0.84)*	0.65 (0.47–0.91)*	0.70 (0.50–0.97)*		
<b>Knowledge of obesity as risk factor for cancer</b>										
No <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.70 (1.39–2.09)*	1.62 (1.39–1.88)*	1.17 (0.97–1.40)	1.34 (1.11–1.60)*	1.79 (1.56–2.05)*	1.56 (1.22–2.00)*	2.00 (1.57–2.55)*	1.91 (1.50–2.43)*		
Don't know	1.25 (0.99–1.59)	1.25 (1.05–1.49)*	0.98 (0.79–1.22)	1.15 (0.93–1.43)	1.25 (1.07–1.46)*	0.88 (0.66–1.18)	1.34 (1.01–1.78)*	1.28 (0.96–1.70)		
<b>Survey year</b>										
2013 <sup>b</sup>	–	1.00	–	–	1.00	–	–	–	–	–
2016	1.00 <sup>b</sup>	0.95 (0.81–1.11)	1.00 <sup>c</sup>	1.00 <sup>c</sup>	0.83 (0.71–0.96)*	–	–	–	–	–
2019	1.13 (0.94–1.36)	0.92 (0.78–1.09)	1.16 (0.99–1.37)	1.02 (0.86–1.20)	0.77 (0.66–0.89)*	1.00 <sup>d</sup>	1.00 <sup>d</sup>	1.00 <sup>d</sup>	1.00 <sup>d</sup>	1.00 <sup>d</sup>

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**Table 3 Cont.: Support for regulation by sociodemographic characteristics, BMI and knowledge of obesity as a risk factor for cancer in the 2013, 2016 and 2019 Cancer Prevention Community Surveys.**

Characteristic	OR for support (95% CI)				
	The government subsidising fresh fruit and vegetables so they cost less	Increased government funding of public media campaigns about healthy eating	A health levy on sugary drinks to pay for programs to educate people on healthy eating and the cost of diet-related health problems	A tax on unhealthy foods to pay for programs to educate people on healthy eating and pay for the cost of diet-related health problems	Increasing the price of unhealthy foods to discourage people from consuming them
<b>Sex</b>					
Men <sup>b</sup>	1.00	1.00	1.00	1.00	1.00
Women	2.02 (1.60–2.56)*	1.08 (0.87–1.34)	1.32 (1.07–1.62)*	0.97 (0.87–1.09)	1.05 (0.94–1.17)
<b>Age group</b>					
18–39 years <sup>b</sup>	1.00	1.00	1.00	1.00	1.00
40–59 years	0.57 (0.43–0.76)*	0.95 (0.74–1.22)	0.82 (0.64–1.05)	0.84 (0.74–0.96)*	0.85 (0.74–0.96)*
≥60 years	0.48 (0.36–0.65)*	1.53 (1.16–2.01)*	1.37 (1.04–1.78)*	1.19 (1.03–1.38)*	1.24 (1.07–1.43)*
<b>IRSD quintile</b>					
Lowest (most disadvantaged) <sup>b</sup>	1.00	1.00	1.00	1.00	1.00
Second	1.07 (0.70–1.64)	1.01 (0.69–1.46)	1.49 (1.03–2.16)*	1.16 (0.96–1.40)	1.11 (0.92–1.34)
Third	0.95 (0.63–1.44)	1.12 (0.78–1.63)	1.29 (0.89–1.87)	1.18 (0.98–1.42)	1.25 (1.04–1.50)*
Fourth	0.75 (0.49–1.14)	1.31 (0.89–1.92)	1.85 (1.26–2.71)*	1.41 (1.16–1.72)*	1.31 (1.08–1.59)*
Highest	1.06 (0.72–1.55)	1.32 (0.94–1.86)	1.69 (1.20–2.38)*	1.24 (1.04–1.47)*	1.26 (1.06–1.50)*
<b>Parent of children aged &lt;18 years</b>					
No <sup>a</sup>	1.00	1.00	1.00	1.00	1.00
Yes	1.33 (1.00–1.76)	1.18 (0.92–1.51)	1.15 (0.91–1.47)	1.17 (1.00–1.38)	1.34 (1.14–1.57)*
<b>BMI</b>					
≤25 kgm <sup>-2b</sup>	1.00	1.00	1.00	1.00	1.00
>25 kgm <sup>-2</sup>	1.14 (0.88–1.47)	0.84 (0.67–1.07)	0.79 (0.63–1.00)*	0.80 (0.71–0.91)*	0.82 (0.73–0.93)*
Not answered	0.88 (0.61–1.27)	0.57 (0.41–0.79)*	0.58 (0.42–0.81)*	0.60 (0.51–0.71)*	0.67 (0.56–0.79)*
<b>Knowledge of obesity as risk factor for cancer</b>					
No <sup>b</sup>	1.00	1.00	1.00	1.00	1.00
Yes	1.34 (1.03–1.75)*	1.58 (1.24–2.01)*	1.63 (1.28–2.07)*	1.65 (1.45–1.87)*	1.48 (1.30–1.67)*
Don't know	1.15 (0.84–1.57)	1.05 (0.79–1.40)	1.11 (0.84–1.48)	1.15 (1.00–1.34)	0.96 (0.83–1.12)
<b>Survey year</b>					
2013 <sup>b</sup>	–	–	–	1.00	1.00
2016	–	–	–	1.08 (0.94–1.23)	1.12 (0.98–1.28)
2019	1.00 <sup>d</sup>	1.00 <sup>d</sup>	1.00 <sup>d</sup>	1.17 (1.02–1.34)*	1.04 (0.91–1.19)

Notes:

a: In 2013 and 2016, the statement was "A tax on unhealthy foods to pay for programs to educate people on healthy eating".

b: Reference category. c: 2016 used as reference category as question was not asked in 2013. d: Question only asked in 2019.

\*Significant compared with reference category.

OR, Odds Ratio. CI, Confidence Interval. IRSD, Index of Relative Socio-Economic Disadvantage. BMI, Body Mass Index.



Women were significantly more likely than men to support most policies (significant OR point estimate range 1.24–2.02) as were those in the older age groups compared with those aged under 40 years. Those in the oldest age group were significantly more supportive of all policies (significant OR point estimate range 1.19–2.36), except for subsidising fresh fruit and vegetables where they were significantly less supportive (OR 0.48; 95%CI: 0.36–0.65). Those in the highest advantage quintile (IRSD) were generally more likely to support policies. Those who knew about obesity as a risk factor for cancer were significantly more supportive of most food labelling regulation (significant OR point estimate range 1.34–1.70), all forms of marketing regulation surveyed (significant OR point estimate range 1.56–2.00) and all fiscal policies (significant OR point estimate range 1.34–1.65). The only significant trends for change in support for policies over the three time points was less support for a ban on unhealthy food advertising in 2016 (OR 0.83; 95%CI: 0.71–0.96) and 2019 (OR 0.77; 95%CI:

0.66–0.89) compared with 2013, and more support for a tax on unhealthy foods (to pay for programs to educate people on healthy eating and pay for the cost of diet-related health problems) in 2019 compared with 2013 (OR 1.17; 95%CI: 1.02–1.34), see Table 3.

### Concern about food marketing to children in different media

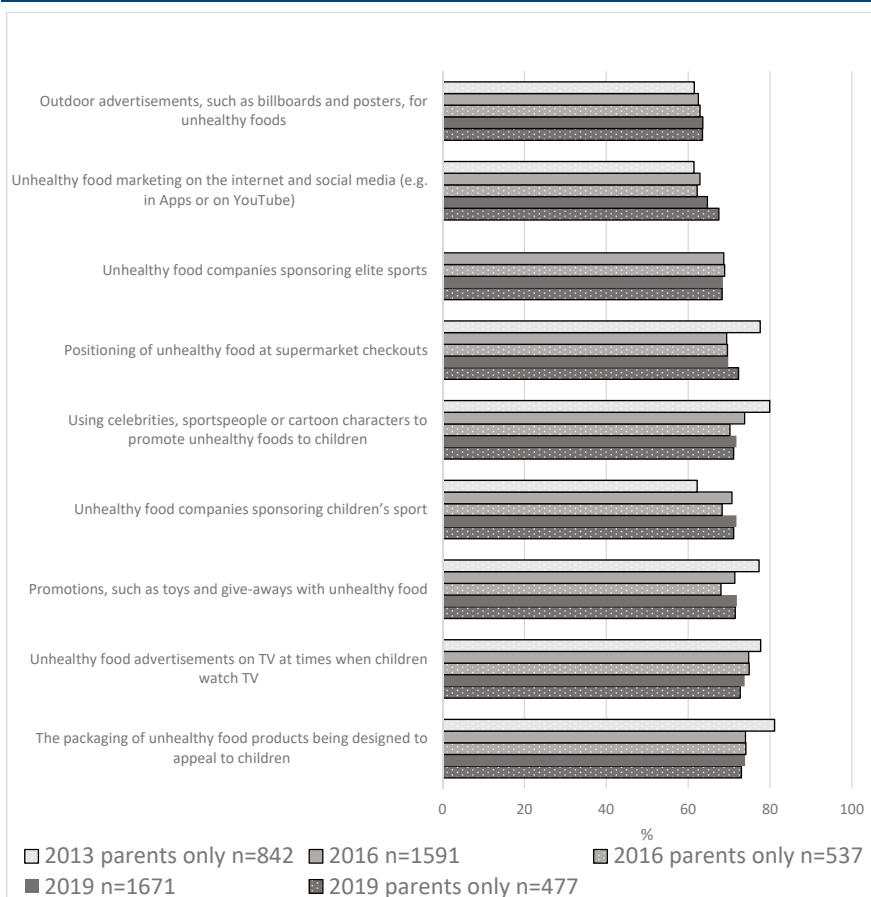
In 2019, a high proportion of participants were concerned about food marketing to children (63.6% to 73.9%), see Figure 1. Concern was highest for packaging designed to appeal to children (73.9%) and advertisements on television of unhealthy food products (73.8%).

Concern for unhealthy food and drink marketing to children by sociodemographic characteristics, BMI and knowledge of obesity as a risk factor for cancer in the 2016 and 2019 surveys is shown in Table 4. Across the age groups, people aged over 60 were significantly more likely to be concerned about all scenarios (significant

OR point estimate range 1.79–2.61) and women were significantly more concerned in most scenarios than men (significant OR point estimate range 1.21–1.39). Parents were more likely than non-parents to be concerned about positioning unhealthy food at supermarket checkouts (OR 1.32; 95%CI: 1.09–1.60) and outdoor advertisements for unhealthy food (OR 1.22; 95%CI: 1.02–1.46). Those who knew about the link between obesity and cancer risk were significantly more likely to be concerned about marketing and promotions for all scenarios (significant OR point estimate range 1.51–1.70) than those who did not know about the link. Concern increased in 2019 compared with 2016 for unhealthy marketing on the internet and social media (OR 1.21; 95%CI: 1.02–1.43).

The results of the sensitivity analysis using the data from all three surveys combined, among parents of children aged <18 years only, is shown in Supplementary Table 1. Over time, there was a significant increase in the proportion of parents concerned about sponsorship of children's sport (2016: OR 1.68; 95%CI: 1.30–2.16; 2019: OR 1.76; 95%CI: 1.34–2.31), and in 2019 for marketing on the internet and social media (OR 1.61; 95%CI: 1.24–2.11) and outdoor advertising (OR 1.33; 95%CI: 1.03–1.72), while there was a decreasing trend in concern for use of celebrities or cartoon characters in advertising (2016: OR 0.74; 95%CI: 0.56–0.98; 2019: OR 0.73; 95%CI: 0.55–0.98).

**Figure 1: Weighted proportion of participants who answered very/somewhat concerned to the question 'Unhealthy food and drinks currently are marketed to children in each of the following ways. How concerned are you about each?' (%).**



### Discussion

This study found limited changes in support over time; however, support for many policies was strong and sustained.

Our results reflect previous Australian studies that have shown support for food labelling as high as 90% for mandatory front-of-pack labelling<sup>31</sup> and consistent levels of support for a tax on food or sugary drinks (over 40%).<sup>31,32</sup> For promotions, the highest support has been for restrictions on television (approx. 80%), and more than 60% support for other food advertising or sponsorship restrictions.<sup>16,33</sup> We found a decrease in support for banning food advertising that targets children, although concern for advertising on the internet/social media had increased, likely reflecting changes in children's media consumption towards internet use.

International studies have shown that those initiatives targeting children and young people attract the most support as

**Table 4. Concern for unhealthy food and drink marketing to children by sociodemographic characteristics, BMI and knowledge of obesity as a risk factor for cancer in the 2016 and 2019 Cancer Prevention Community Surveys.**

Characteristic	OR for being very/somewhat concerned (95% CI)									
	The packaging of unhealthy food products being designed to appeal to children	Unhealthy food advertisements on TV at times when children watch TV	Promotions, such as toys and give-aways with unhealthy food	Unhealthy food companies sponsoring children's sport	Using celebrities, sportspeople or cartoon characters to promote unhealthy foods to children	Positioning of unhealthy food at supermarket checkouts	Unhealthy food companies sponsoring elite sports	Unhealthy food marketing on the internet and social media (e.g. in Apps or on YouTube)	Outdoor advertisements, such as billboards and posters, for unhealthy foods	
<b>Sex</b>										
Men <sup>a</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Women	1.39 (1.16–1.68)*	1.33 (1.10–1.60)*	1.28 (1.07–1.54)*	1.17 (0.98–1.40)	1.26 (1.05–1.52)*	1.29 (1.09–1.53)*	1.21 (1.02–1.43)*	1.09 (0.93–1.29)	1.13 (0.96–1.32)	
<b>Age group</b>										
18–39 years <sup>a</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
40–59 years	1.09 (0.89–1.35)	1.06 (0.86–1.30)	1.00 (0.81–1.22)	1.00 (0.82–1.23)	1.08 (0.88–1.32)	1.07 (0.88–1.30)	0.96 (0.79–1.16)	1.13 (0.93–1.36)	1.00 (0.83–1.20)	
≥60 years	2.43 (1.86–3.18)*	2.35 (1.79–3.08)*	1.95 (1.51–2.51)*	1.79 (1.39–2.29)*	2.61 (2.00–3.42)*	2.12 (1.67–2.70)*	2.01 (1.58–2.55)*	2.15 (1.70–2.72)*	1.82 (1.46–2.26)*	
<b>IRSD quintile</b>										
Lowest (most disadvantaged) <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Second	0.82 (0.60–1.11)	0.93 (0.68–1.27)	0.96 (0.71–1.30)	1.05 (0.78–1.42)	0.99 (0.73–1.34)	1.07 (0.80–1.45)	1.00 (0.75–1.34)	1.12 (0.85–1.49)	0.94 (0.71–1.23)	
Third	0.99 (0.73–1.35)	1.05 (0.77–1.43)	0.91 (0.68–1.23)	0.95 (0.71–1.26)	0.94 (0.70–1.26)	0.91 (0.69–1.21)	0.91 (0.69–1.21)	0.95 (0.72–1.25)	0.94 (0.72–1.22)	
Fourth	1.06 (0.77–1.48)	1.09 (0.79–1.52)	0.93 (0.68–1.27)	1.08 (0.79–1.47)	1.09 (0.79–1.50)	0.94 (0.70–1.27)	0.92 (0.69–1.24)	1.14 (0.85–1.53)	0.95 (0.72–1.26)	
Highest	1.14 (0.85–1.53)	1.18 (0.88–1.59)	1.15 (0.86–1.53)	1.19 (0.90–1.57)	1.29 (0.97–1.72)	0.98 (0.75–1.29)	1.13 (0.87–1.48)	1.03 (0.80–1.34)	0.96 (0.74–1.23)	
<b>Parent of children aged &lt;18 years</b>										
No <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.17 (0.95–1.43)	1.17 (0.95–1.43)	1.14 (0.94–1.39)	1.06 (0.87–1.30)	1.04 (0.85–1.27)	1.32 (1.09–1.60)*	1.17 (0.97–1.41)	1.16 (0.97–1.40)	1.22 (1.02–1.46)*	
<b>BMI</b>										
≤25 kgm <sup>-2a</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
>25 kgm <sup>-2</sup>	1.04 (0.84–1.29)	0.97 (0.78–1.20)	0.92 (0.75–1.14)	0.97 (0.79–1.19)	1.00 (0.81–1.23)	1.04 (0.86–1.27)	0.99 (0.82–1.20)	0.91 (0.75–1.10)	0.91 (0.76–1.09)	
Not answered	0.80 (0.62–1.03)	0.77 (0.59–1.00)*	0.67 (0.52–0.86)*	0.83 (0.65–1.07)	0.89 (0.69–1.16)	0.99 (0.77–1.26)	0.95 (0.74–1.21)	0.84 (0.66–1.07)	0.82 (0.66–1.04)	
<b>Knowledge of obesity as risk factor for cancer</b>										
No <sup>b</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Yes	1.53 (1.25–1.88)*	1.64 (1.34–2.02)*	1.63 (1.33–1.98)*	1.70 (1.40–2.07)*	1.57 (1.28–1.92)*	1.62 (1.34–1.96)*	1.62 (1.34–1.96)*	1.51 (1.26–1.82)*	1.56 (1.30–1.86)*	
Don't know	1.19 (0.93–1.52)	1.22 (0.95–1.56)	1.29 (1.02–1.64)*	1.27 (1.01–1.61)*	1.24 (0.97–1.59)	1.15 (0.92–1.44)	1.23 (0.99–1.55)	1.09 (0.87–1.36)	1.12 (0.91–1.39)	
<b>Survey year</b>										
2016 <sup>c</sup>	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2019	1.04 (0.86–1.25)	0.99 (0.82–1.19)	1.00 (0.84–1.20)	1.00 (0.84–1.20)	0.94 (0.78–1.13)	1.10 (0.92–1.30)	1.04 (0.88–1.23)	1.21 (1.02–1.43)*	1.07 (0.91–1.26)	

Notes:  
a: Reference category.  
\*Significant compared with reference category.  
OR, Odds Ratio; CI, Confidence Interval; IRSD, Index of Relative Socio-Economic Disadvantage; BMI, Body Mass Index

well as those that are the least intrusive, for example, policies providing information such as labelling.<sup>32,34–36</sup> This is reflected in the finding that strong support for food labelling in Australia was attributed to respondents' beliefs that this regulation would educate other people about nutrition.<sup>31</sup> As our study also found, women and older respondents are more likely to endorse more restrictive measures.<sup>34</sup>

Fewer than half of those surveyed in 2019 identified obesity as a risk factor for cancer (44%). Prompted awareness in the UK was 57% in 2016<sup>37</sup> and in the US was 53% in 2019.<sup>38</sup> Our study further corroborated previous work that showed support for food policy initiatives was higher among those who were aware of the link between cancer risk and obesity.<sup>26</sup> We found that those aware of the obesity–cancer link were more likely to support fiscal policies, up to twice as likely to support food marketing regulations, and at least 50% more likely to be concerned about food marketing and promotions. Raising population awareness of the obesity–cancer link through mass-media campaigns may therefore increase support for policy action even further. Several studies have shown greater support for government policies is associated with an understanding that overweight is caused by the food environment and is outside the individual's control.<sup>39,40</sup> Reynolds et al. (2020) has recently challenged these results, finding no change in support for policies when the environmental causes of obesity were communicated,<sup>41</sup> concluding in a meta-analysis that the different results could be due to insufficiently persuasive messages.<sup>42</sup> The 'nanny state' narrative by the food industry or in media may also be another contributor to how the public perceives regulatory measures. Although causation cannot be established, there is evidence that support for evidence-based alcohol policy in New South Wales decreased compared with many other Australian states following negative public discourse about government restrictions on alcohol availability in New South Wales.<sup>43</sup> More investigation is warranted, particularly into messaging, although with already high levels of support for many policies the question remains why policy solutions have not progressed.

Over the past ten years, there has been little obesity prevention policy implementation in Australia despite moderate to high support from the public for change.<sup>44</sup> A study of the

role of public opinion on policy success in five European countries found advocacy success increased with the proportion of the public supporting a policy.<sup>45</sup> Policy implementation hinges on political will, and besides taking into account the evidence and public appetite, it also needs to be seen as a political priority, cutting through other concerns such as economic or environmental concerns.<sup>44</sup> It is also subject to political processes and timings, and it has been suggested that advocates should consider adapting frames to resonate with the ideologies of different political parties to increase political support.<sup>46</sup> The influence of public will on the political process is also competing with the ability of the food industry to shape the food environment, frame the narrative and influence decision makers.<sup>22,23</sup> As is already being practised by the food industry, public health advocates should improve networks with decision makers.<sup>47</sup> It is up to public health advocates to proactively and strategically target decision makers with well-framed and politically palatable solutions<sup>22</sup> through a range of activities<sup>24,48</sup> and capitalise on the backing that this strong public support indicates. It is particularly timely in 2021, as both a long-term National Preventive Health Strategy and a National Obesity Strategy are being developed to help Australians at all stages of life improve their health including through improving diet.<sup>25</sup>

A limitation of this study is the sampling, an online self-selected panel, although efforts were made to ensure demographics represented New South Wales residents. As only one Australian state was sampled, albeit the most populated, the findings cannot necessarily be extrapolated to Australia as a whole, but the results do reflect other findings within Australia and overseas. The study is also limited by sample size so that variables such as cultural diversity could not be explored. A strength is the consistency of methods over the three time points, but as such it captures results at the specific survey time, and it cannot be determined if particular events may have influenced support at those time points. The BMI data may not be representative as it was calculated from self-reported data that could be prone to inaccuracy, with 13% of participants not providing data and the results showing a lower proportion in the overweight and obese categories compared with the population. This study did not investigate reasons for support/non-support for policy;

this could be a useful area for future research to inform framing of issues to move those who are unsure or unsupportive to the supportive category.

## Implications for public health

This study shows public willingness to support obesity prevention policy options is strong and sustained, although not increasing in the six-year study period. These results form part of a package that, along with the well-established evidence, makes the case for policy action in Australia. Comprehensive policy actions are required to create an enabling environment to address the rise in obesity-related non-communicable disease. Progress on policies has been made overseas and Australia can learn from those early adopters. A National Preventive Health Strategy and an Obesity Strategy will be a promising start to providing a framework for action and a clear plan for implementing these strategies will be critical to their success.

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## Supporting Information

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

**Supplementary Table 1:** Concern for unhealthy food and drink marketing to children by sociodemographic characteristics, BMI and knowledge of obesity as a risk factor for cancer among parents of children aged <18 years in the 2013, 2016 and 2019 Cancer Prevention Community Surveys.