

ORIGINAL RESEARCH

Quenching Australia's thirst: A trend analysis of water-based beverage sales from 1997 to 2011

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Abstract

Aim: To show trends in sales of sugar-sweetened and non-sugar water-based beverages in Australia over a 15-year period.

Methods: Data were obtained from grocery sales surveys and adjusted to yield total market sales. Trends were examined using regression analysis both in absolute terms and per head. Home scan data were used to evaluate patterns of carbonated soft drink purchase according to income and household structure. Usage patterns by age and sex were also assessed.

Results: Sales of non-alcoholic, water-based beverages grew at a rate of 1.7% per annum, driven largely by sales of non-sugar varieties (4.9% per annum) with a smaller contribution from sugar-sweetened beverages (0.3% per annum). Volume share of non-sugar increased from 30 to 42% over the 15-year period, while sugar sweetened showed sustained loss of share. Sales of sugar-sweetened carbonated soft drinks fell over 15 years at a rate of 0.7% per annum, with a drop in volume share of 18%. Still water, energy and sports drinks showed persistent growth. Sugar contribution from water-based beverages and soft drinks fell from 9.2 to 7.6 kg per person and from 8.4 to 6.2 kg per person, respectively. Soft drinks, energy drinks and sports drinks were most popular with teenagers and young adults, but not with older individuals. Low-income households purchased less soft drinks compared to middle- and high-income households.

Conclusions: The water-based beverage category is undergoing a fundamental shift from sugar-sweetened to non-sugar drinks. The consequent fall in the sugar contribution from water-based beverages, and soft drinks in particular, is consistent with public health objectives.

Key words: beverage, carbonated beverage, dietary sucrose, drinking.

Introduction

Consumption of packaged, non-alcoholic, water-based beverages is increasing worldwide driven by changing lifestyles, innovative products and health concerns in developed countries and by the growth of disposable incomes and the rising influence of Western culture in many developing countries.¹ This broad category of beverages comprises both sugar-sweetened and non-sugar beverages of varying energy density. Among nutritionists, there has been a particular focus on soft drinks following reports of increased consumption of sugar-sweetened beverages² and associations between the intake of these drinks and the risk of obesity and type 2 diabetes in the United States.^{3,4}

The National Health and Nutrition Examination Survey series has enabled several US analyses of trends in consumption of sugar-sweetened beverages and their contribution to sugar intakes in various groups according to age, sex, ethnicity and socioeconomic background.^{2,5–7} In contrast, nationally representative data for beverage consumption for Australians are scant, the last National Nutrition Survey of adults being published in 1995 and the previous survey in 1983.^{8,9} The most recent survey of children showed that non-milk, non-alcoholic beverages contributed approximately 5–7% of children's daily energy intake.¹⁰ A recent assessment of trends in sugar consumption in Australia using apparent consumption data from the Food and Agriculture Organization and sales data supplied by beverage manufacturers showed a decline in apparent sugar consumption over the last 30 years.¹¹ Given the US findings, the apparent paradox of falling sugar intakes and rising obesity rates in Australia needs further exploration, but the lack of other data sets has precluded this.

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Aware of the increasing focus and concern about sugar-sweetened beverages and their potential role in the development of overweight, the Australian Beverage Council previously commissioned research into purchasing patterns of non-alcoholic, water-based beverages for the period 1997–2006.¹² The study found that the sugar supply from beverages had declined, mostly as a result of decreasing sales of sugar-sweetened carbonated soft drinks since 2002. These sales data were considered to be a reasonable proxy for apparent consumption of beverages and a guide to trends in sugar consumption from these sources. The objective of the current study is to update these earlier findings to include the years from 2007 to 2011, thereby providing insights into trends over a 15-year period.

Methods

For the purposes of the present study, water-based beverages were defined as ready to drink from the packaging and predominantly water based.¹² The subcategories of beverages included in the analysis were carbonated soft drinks, sports drinks, energy drinks, iced tea, mineral water, mixers (e.g. tonic water and ginger beer) and still water. Non-sugar beverages included all diet varieties as well as plain non-flavoured mineral and still waters. Cordial, syrup-based carbonated soft drinks, tap water and milk-based beverages were excluded from the analysis as they did not meet the criteria for ready to drink from the packaging or were not predominantly water based. In addition, data for fruit juice were not available for this analysis. No alcoholic beverages were included in this analysis. The Australian Beverage Council Ltd., representing major water-based beverage companies in Australia, commissioned AC Nielsen to provide the raw data for this research.

Trends in volume sales: Purchasing data were sourced from AC Nielsen Scan Track surveys reflecting annual grocery volume sales of water-based beverages nationally. Scan Track is a set of surveys designed to capture product movement and market share in the retail sector using scanning equipment and professional retail auditors. Data were provided for the years 2007–2011 adding to a data set from the same source published in a previous study.¹²

Given that the data provided were reflective of grocery sales only, volume sales in litres were adjusted, using industry estimates provided by research departments of member beverage companies, to impute a total market figure by extrapolating grocery data to include foodservice, vending, convenience and dining purchases. These figures were then combined with data from a previous study¹² to provide a data set spanning 15 years from 1997 to 2011. Volume sales were examined over the 15-year period, both in absolute terms and on a per capita basis. Per capita trends were assessed by dividing annual volume sales by the estimate of the Australian resident population for that year obtained from the Australian Bureau of Statistics.

The proportion of water-based beverages coming from each beverage category (volume share) was also assessed

each year for the 15-year period. Linear regression analyses were used to assess trends over time. Significance was set at $P < 0.05$. Annual growth rates were calculated using the equation:

$$\text{Annual growth rate} = [(v^e - v^b)/v^b \times 100]/n,$$

where v^e is the volume sales at the end of the period, v^b is the volume sales at the beginning of the period, and n is the number of years of the period, in this case 15 years.

Trends in sugar contribution from water-based beverages: The sugar contribution to the food supply from water-based beverages was determined by multiplying the annual volume sales by the Brix value (concentration of sugar per 100 mL) for each category of beverage.¹² Sugar contribution was examined year by year to determine trends in absolute sugar mass and also expressed on a per capita basis to prevent confounding due to population growth.

Demographic penetration: Reported consumption behaviours were provided from the AC Nielsen Home Scan Consumer Panel, a survey of 10 000 households, demographically representative of the Australian population. In this panel, participants use a scanner to record all household purchases from supermarkets, convenience stores and pharmacies over a one-year period. Interviews are then conducted to identify usage patterns. Penetration over time (percentage of persons consuming) was examined using linear regression analysis with significance set at $P < 0.05$.

The proportion of men and women in the age groups 12–19, 20–29, 30–39, 40–49 and 50+ years, which reported consumption of carbonated soft drinks, sports drinks, energy drinks, still and mineral waters, mixers and iced teas, was provided from the survey for the years 2007–2011. The data could not be combined with those from the 2007 study,¹² as the age categories from the 2007 study no longer applied to the current Home Scan Survey. This analysis also does not examine age groups less than 12 years, as relevant data are not routinely collected from children by the industry.

Patterns of household purchase for carbonated soft drinks: Household penetration data for carbonated soft drinks were analysed from the AC Nielsen Home Scan Consumer Panel. Only data for 2007–2011 were provided for purchases by household structure and family income. Previous data from the 2007 study¹² could not be combined in the analysis as the definitions used to describe household structures and the income brackets have changed since 2006. The share of sugar and non-sugar carbonated soft drinks purchased by each household unit was examined over the five-year period and then averaged over the five years.

Household structures have been defined as:

- Young transitionals (adults ≤ 35 , no children)
- Independent singles (one adult, >35 , no children)
- Start-up families (oldest child <6 years)

- Small-scale families (oldest child 6–11 years)
- Bustling families (oldest child 12–17 years)
- Established couples (two or more adults, 35–59 years, no children or children ≥ 18 years)
- Senior couples (two or more adults, 60+ years, no children or children ≥ 18 years)

To demonstrate socioeconomic differences in carbonated soft drink purchase, sales were expressed in three income brackets: low income ($\leq \$35\,000$), middle income ($\$35\,001$ – $\$70\,000$) and high income ($\geq \$70\,001$). The shares of sugar and non-sugar carbonated soft drinks purchased by each income bracket were examined for the five-year period. The difference between the means was determined by analysis of variance with an alpha level of 0.5.

All data were analysed using Microsoft Excel (Microsoft Office 2011, Microsoft Corporation, Richmond, VA, USA) and StatPlus for Mac OS LE 2009 (AnalystSoft Inc., 2011, <http://www.analystsoft.com/en/products/statplussmacle/>).

Results

Trends in volume sales: Over 15 years, from 1997 to 2011, the sales of non-alcoholic, water-based beverages in Australia increased by 26% with an annual growth rate of 1.7% (Table 1). This was a significant positive trend that was consistent over 15 years ($P < 0.05$). Movement was largely driven by increasing sales of non-sugar beverages ($P < 0.05$), which increased by 73% with an annual growth rate of 4.9%. The sugar-sweetened beverage category grew by 5% with an annual growth rate of 0.3% and the trend was also significant ($P < 0.05$). This growth in sugar-sweetened beverages was largely due to increases in the energy drink, iced tea and sports drinks categories (significant positive trend at $P < 0.05$, respectively), albeit in much smaller volume quantities than for non-sugar carbonated soft drinks.

By 2011, volume share of non-sugar beverages was 42%, up from 30% in 1997, while sugar-sweetened beverages lost

Table 1 Trends in volume sales of water-based beverages between 1997 and 2011

Beverage category	Volume sales 1997 (L)	Volume sales 2011 (L)	Annual growth rate (%)	Difference per capita 1997 and 2011 (litres per person)	Losses/gains in volume share ^(a) 1997–2011 (%)
All water-based beverages					
Total	2 215 489 436	2 785 846 008	1.7*	4.8	
Sugar sweetened	1 547 459 692	1 627 701 086	0.3*	–10.8	–11
Non-sugar	668 029 744	1 158 144 922	4.9*	15.6	11
Carbonated soft drinks					
Total	1 833 809 026	1 894 823 498	0.2*	–14.3	–15
Sugar sweetened	1 410 249 641	1 260 981 784	–0.7*	–19.7	–18
Non-sugar	423 559 385	633 841 714	3.3*	5.4	4
Energy drinks					
Total	2 645 949	73 742 155	179*	3.1	3
Sugar sweetened	2 645 949	68 659 334	166*	2.9	3
Non-sugar	0	5 082 820	NA*	0.2	Less than 1
Sports drinks					
Total	27 546 462	60 172 806	7.9*	1.2	1
Still waters					
Total	107 430 564	419 924 678	19.4*	12.9	10
Sugar sweetened	315 487	11 121 520	228*	0.5	Less than 1
Still non-flavoured	107 115 077	408 803 158	18.8*	12.4	10
Iced tea					
Total	2 817 231	33 228 586	72*	1.3	1
Sugar sweetened	2 817 231	28 170 767	60*	1.1	1
Non-sugar	0	5 057 819	NA*	0.2	Less than 1
Mineral waters					
Total	92 959 590	124 948 345	2.3*	0.6	Less than 1
Sugar sweetened	40 397 128	41 653 752	0.2*	–0.3	Less than 1
Non-sugar	52 562 462	83 294 593	4.0*	0.9	Less than 1
Mixers					
Total	148 280 615	179 005 939	1.4*	0.0	Less than 1
Sugar sweetened	63 540 923	156 962 192	9.8*	3.6	Less than 1
Non-sugar	84 739 692	22 043 747	–4.9*	–3.6	Less than 1

^(a) Volume share calculated as percentage of total water-based beverages.

*Trend significant at $P < 0.05$.

NA denotes figures not calculable because the divisor is zero.

Source: AC Nielsen Scan Track, adjusted for total market figures.

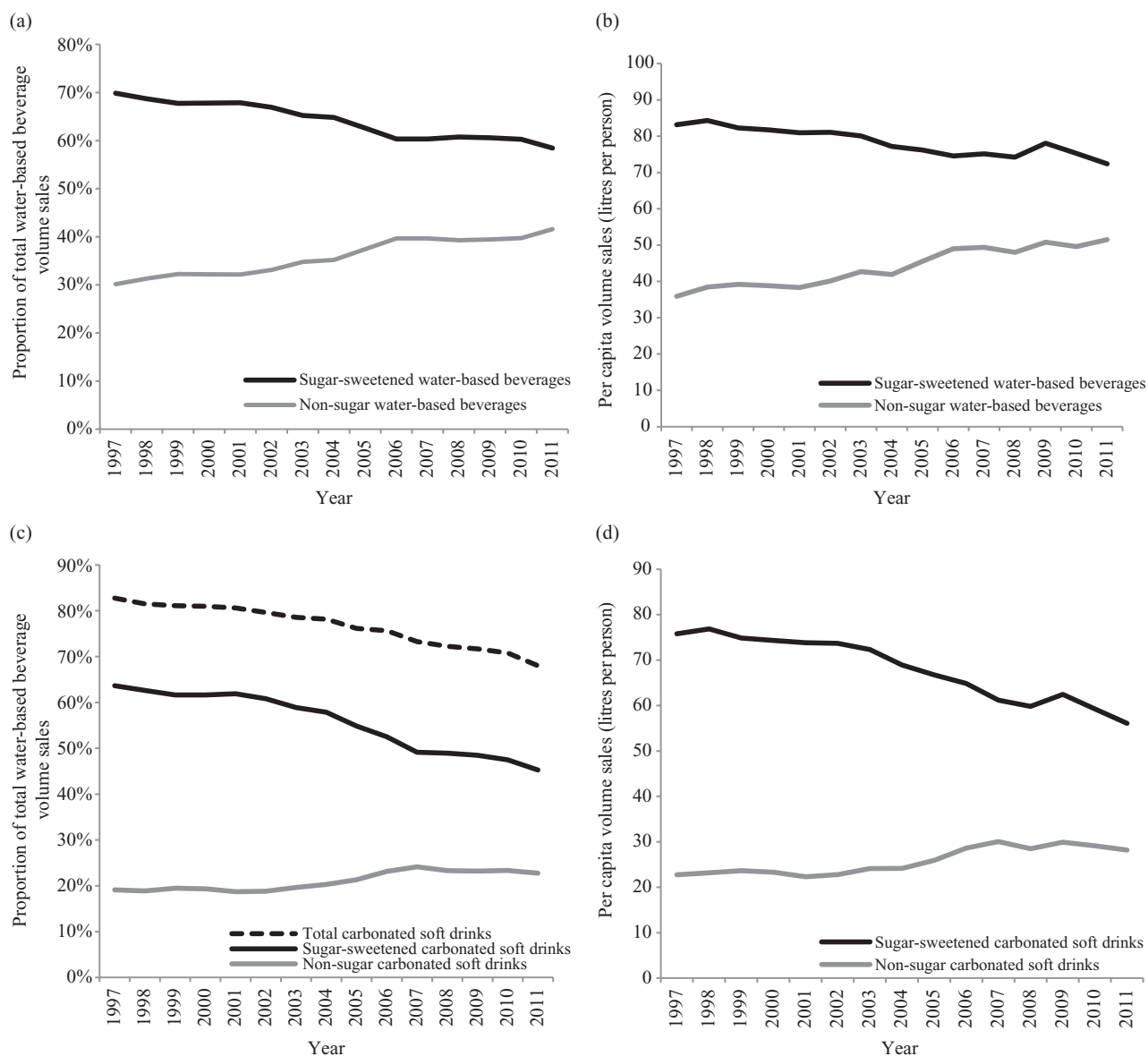


Figure 1 Trends in volume share and per capita volume sales of water-based beverages and carbonated soft drinks, 1997–2011. (a) Volume share for water-based beverages. (b) Per capita volume sales for water-based beverages. (c) Volume share for carbonated soft drinks. (d) Per capita volume sales for carbonated soft drinks. *Source: AC Nielsen Scan Track, adjusted for total market figures. All trends significant at $P < 0.05$.*

volume share moving from 70% in 1997 down to 58% by 2011 (Figure 1a). Taking into account the growth in the estimated resident population of Australia, figures show a decline in the volumes purchased per person for sugar-sweetened beverages by almost 11 litres since 1997, while non-sugar beverages have increased by almost 16 L per person (Figure 1b). Much of that loss of volume for sugar-sweetened beverages is due to the declining sales of carbonated soft drinks ($P < 0.05$), in particular sugar-sweetened varieties ($P < 0.05$), which declined at a rate of 0.7% per annum and lost 18% volume share over the 15 years (64% in 1997 compared to 45% in 2011) (Figure 1c). Sugar-sweetened carbonated soft drinks declined by almost 20 L

per person between 1997 and 2011 from 75.8 to 56.1 L per person (Figure 1d). Concomitantly, non-sugar soft drinks increased by more than 5 L per person, from 22.8 to 28.2 L per person over the same period.

Volume sales of non-flavoured still water ($P < 0.05$) increased at a rate of 19% per annum from 107 million litres in 1997 to almost four times that volume in 2011. This resulted in a 12.4 L per person increase in plain water purchase and a 10% gain in volume share. Non-sugar mineral waters also grew by 4% per annum, but this did not translate to an increase in volume share. While sugar-sweetened mineral waters showed a decline in sales ($P < 0.05$), sugar-sweetened still waters, which include all vitamin and

flavoured waters, increased at a rate of 228% per annum ($P < 0.05$), albeit from a very small volume base of about 315 000 L in 1997 to 11.1 million litres in 2011. Nevertheless, the per capita increase was small at a half a litre per person between 1997 and 2011, and this did not result in a change in volume share over the period.

While growth was shown for energy drinks (179% per annum) and iced tea (72% per annum), their initial base volume sales in 1997 were small at 2.6 and 2.8 million litres, respectively. By 2011, their sales had increased to 73.7 and 33.2 million litres, respectively (majority from sugar sweetened), but this resulted in only small gains in volume share. Per capita, energy drinks increased by 3.1 L per person between 1997 and 2011. Sports drinks started from slightly higher base volume in 1997 of 27.5 million litres and gained 1% volume share over the 15 years to reach approximately 60 million litres in 2011 with a per capita increase of just 1.2 L per person.

By 2011, carbonated soft drinks accounted for 68% of the market, still waters for 15%, mixers for 6%, mineral waters for 5%, energy drinks for 3%, sports drinks for 2% and iced tea for 1% of the market.

Change in sugar contribution: The total sugar contribution of water-based beverages to the food supply has fluctuated over 15 years from 168 million kilograms in 1997 to 177 million kilograms in 2011 (Figure 2a). Between 2002 and 2007, total sugar contribution declined, only to rise thereafter. However, given the growth of the population, per capita

sugar contribution fell over the 15-year period from 9.2 kg per person in 1997 down to 7.6 kg per person in 2011 (Figure 2b). Carbonated soft drinks showed a consistent decline in total sugar contribution from 159 million kilograms in 1997 down to 137 million kilograms in 2011, with a small rise in 2009. Per capita sugar contributions from carbonated soft drinks continued to fall from 8.4 kg per person in 1997 down to 6.2 kg per person in 2011.

Mixers showed an increase in total sugar contribution from 6.2 to 17.1 million kilograms, which resulted in a 350 g increase in per capita sugar contribution from 1997 to 2011. Per capita sugar contribution was 680 g per person in 2011. Energy drinks consistently increased their total sugar contribution, starting from a small base of 288 000 kg showing rapid rises in the year's post-2006 to 7.5 million kilograms. However, the per capita sugar contribution was small at 300 g per person by 2011. Similarly for sports drinks, consistent increases in total sugar contribution from 1.6 million kilograms in 1997 to 6.6 million kilograms in 2011 were seen across 15 years. Nevertheless, in 2011, per capita sugar contribution was small at 160 g per person, up from 90 g per person in 1997. Iced teas also showed a rise in total sugar contribution from 189 000 kg in 1997 to 3 million kilograms in 2011, translating to 80 g of sugar per person across the population in 2011.

Sugar-sweetened still waters increased their total sugar contribution from 14.5 thousand kilograms in 1997 to 1.2 million kilograms in 2011, a substantial proportional increase, but a mere 20 g increase in sugar per person.

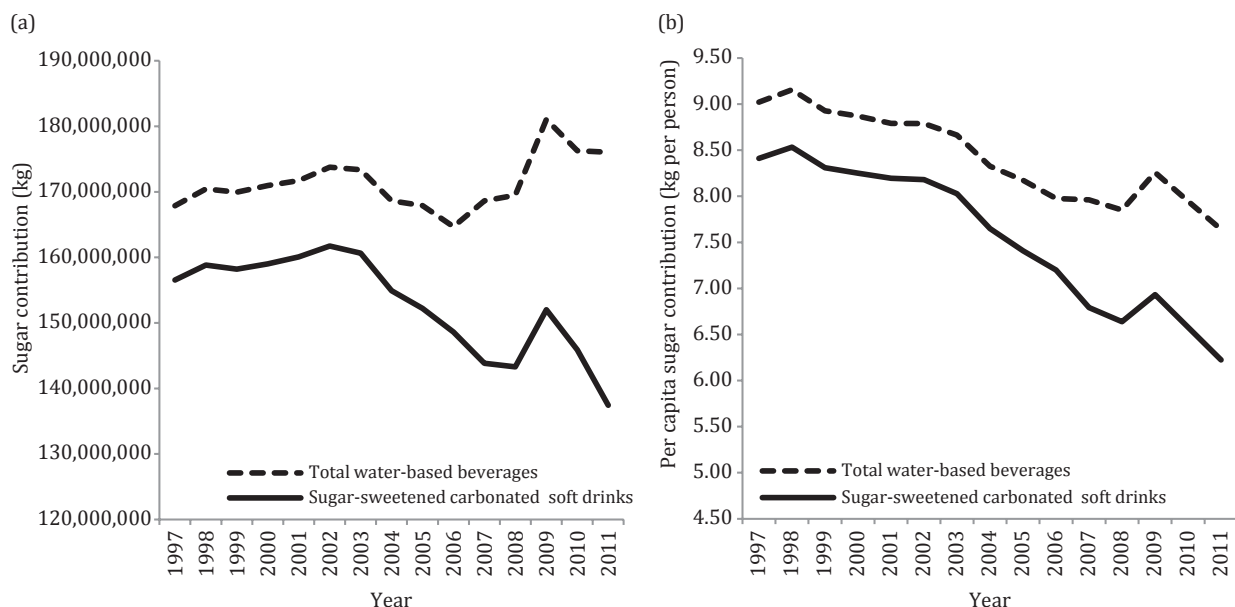


Figure 2 Trends in sugar contribution from water-based beverages and carbonated soft drinks, 1997–2011. (a) Absolute contribution (kilograms). (b) Per capita contribution (kilograms per person). *Source: AC Nielsen Scan Track, adjusted for total market figures. Data based on the following rounded Brix values: 11 g/100 mL for carbonated soft drinks and energy drinks, 10 g/100 mL for mixers, 8 g/100 mL for flavoured mineral waters, 7 g/100 mL for iced tea, 6 g/100 mL for sports drinks and 5 g/100 mL for flavoured still water.*

Mineral waters remained stable with a small difference in total sugar contribution from 1997 to 2011 (3.1 vs 3.2 million kilograms, respectively) and per capita there was a 20 g reduction in per capita sugar contribution between 1997 and 2011. All trends were significant at $P < 0.05$, apart from that for mineral waters, which showed no significant trend.

In 1997, sugar-sweetened soft drinks contributed almost 14 times more sugar to the food supply than all the other sugar-sweetened beverages combined. By 2006, this factor had fallen to 9.2, and in 2011 was 3.5 times, indicative of the fall in volume sales of sugar-sweetened soft drinks and the rise in popularity of functional beverages.

Demographic penetration of water-based beverages: The Nielsen Home Scan Consumer Panel showed that by 2011, penetration of water-based beverages reached 96.9% of participants. Soft drinks were consumed by approximately 90% of individuals (sugar sweetened 84.1% and non-sugar 55.6%). There was a small but significant decline in persons consuming sugar-sweetened soft drinks between 2007 and 2011, but the trend was more pronounced in non-sugar, which showed a decline in persons consuming from 58.6 to 55.6% in 2007 ($P < 0.05$). Energy drinks and iced teas were consumed by 16% of participants (up by 13 and 11%, respectively, in 2007, $P < 0.05$). Sports drinks were consumed by 21% of participants with no significant increase since 2007, and similarly no increase was shown for mixers, which remained at 52% of participants until 2011. The proportion of participants consuming mineral water increased from 36.9 to 41.8% in 2007 ($P < 0.05$), but non-flavoured still water remained the same with no significant increase in penetration over time (42.5% in 2011).

When the data were categorised into five age categories (Table 2), it showed that the teenage male category had the highest proportion of carbonated soft drinks, energy drinks, sports drinks and iced tea consumers. Teenage girls, who,

incidentally, also had the highest proportion of non-flavoured still water drinkers, followed them closely. Older Australians were also less likely to drink carbonated soft drinks, energy drinks, sports drinks, still water and iced tea, but were the group with highest proportion of mixer drinkers.

The most popular beverage was carbonated soft drink, especially with younger people, though it was less popular with people over 50 years. Iced tea was the least popular among consumers with approximately one-fifth choosing this beverage across all age groups. Around one quarter of young people consumed energy drinks and even fewer older Australians with less than 10% consuming. Penetration was slightly higher for sports drinks with around one-third of teenagers consuming. However, penetration fell as age increased with less than 20% of men and women consuming over 50 years.

There was also very little difference in the percentages of men and women consuming within each age group. There were slightly more men drinking soft drinks, energy drinks, sports drinks and iced tea, but more women drinking non-flavoured still water than men. Similar proportions of men and women drank mineral waters.

Household purchase of carbonated soft drinks: Since 2007, the largest proportion of carbonated soft drink volume was purchased by middle- to high-income families. Families with the highest income purchased on average 38% of the volume of sugar-sweetened carbonated soft drinks and 42.5% of the volume of non-sugar carbonated soft drinks. Middle-income families purchased 37.3% of the volume of sugar-sweetened carbonated soft drinks and 33.7% of the volume of non-sugar carbonated soft drinks. Lower income families purchased the smallest volume share of carbonated soft drinks, 24.7% of sugar sweetened and 23.7% of non-sugar. The differences among means for low-, middle- and high-income groups were statistically significant. Over time, lower income

Table 2 Demographic penetration of selected water-based beverages (% of persons consuming)^(a)

Age category (years)	Carbonated soft drink		Energy drinks	Sports drinks	Iced tea	Still unflavoured water	Mineral water	Mixers
	Sugar	Non-sugar						
Men								
12–19	96.0	66.7	25.9	39.5	21.6	55.2	41.4	52.7
20–29	91.3	63.4	25.5	27.8	20.0	49.3	43.6	54.5
30–39	91.0	63.2	22.4	25.5	16.5	52.4	43.0	49.9
40–49	91.5	63.2	18.1	30.6	16.7	50.3	40.3	50.8
50+	84.1	56.7	9.4	17.0	11.7	34.2	36.0	55.0
Women								
12–19	95.3	65.3	24.2	35.0	20.8	57.7	41.4	51.6
20–29	89.8	62.2	24.1	24.4	19.7	53.0	43.1	53.4
30–39	90.7	62.4	21.0	25.9	15.9	53.7	44.1	49.5
40–49	90.1	62.1	18.8	29.6	17.1	52.4	40.5	52.3
50+	82.8	54.4	8.7	14.5	11.8	35.6	35.7	55.3

^(a) Data have been averaged over five years, 2007–2011, for each age group.

Source: AC Nielsen Home Scan Consumer Panel.

Table 3 Share of carbonated soft drinks purchased according to household structure (% of total volume purchased)^(a)

<i>Household structure</i>	<i>Sugar-sweetened carbonated soft drink (%)</i>	<i>Non-sugar carbonated soft drink (%)</i>
Young transitionals (adults ≤35, no children)	8.9	9.1
Independent singles (one adult >35, no children)	9.6	14.0
Start-up families (oldest child <6)	6.6	6.0
Small-scale families (oldest child 6–11)	12.5	11.1
Bustling families (oldest child 12–17)	25.7	20.0
Established couples (two or more adults 35–39, no children or children ≥18 years)	23.3	26.7
Senior couples (two or more adults, 60+, no children or children ≥18 years)	13.3	12.7

^(a) Data have been averaged over five years, 2007–2011, for each household structure category.

Source: AC Nielsen Home Scan Consumer Panel.

families purchased less volume share of both sugar-sweetened and non-sugar carbonated soft drinks, which was taken up by families in the high-income bracket.

According to data from the Home Scan Consumer Panel, families with teenage children and those with older adults in the household purchased the largest volume share of carbonated soft drinks (Table 3). In fact, families with teenage children purchased the most sugar-sweetened soft drinks, while families where parents were slightly older and perhaps had children in their 20s purchased the largest share of non-sugar soft drinks. Families with young children purchased the lowest volume share of both sugar-sweetened and non-sugar soft drinks of all household types. Most family structures purchased a similar volume share of sugar-sweetened and non-sugar soft drinks, except for singles over 35 years who tended to purchase more non-sugar soft drinks and families with teenagers who clearly preferred sugar-sweetened soft drinks.

Discussion

This analysis of sales data indicates that water-based beverages comprise a dynamic category with several long-term and short-term trends in evidence. Over the 15-year time frame of the present study, total sales of water-based beverages increased at an annual rate of 1.7%, a trend that may be attributable to changing lifestyles and largely driven by non-sugar varieties.

Within the category, the proportion of beverages that is sugar sweetened is in long-term decline, falling from 70 to 58% of the total. The major contributor to this trend is a substantial decline in proportion of sugar-sweetened carbonated soft drinks, which fell from 64 to 45% of water-based beverage sales between 1997 and 2011. The corresponding increase in the proportion of non-sugar beverages is primarily due to increases in non-sugar soft drinks and non-flavoured still water. Health consciousness, especially in relation to body weight, is considered to be driving this trend, gaining in significance in relation to the traditional market drivers of indulgence and convenience.¹³ In response to the increased consumer focus on health, manufacturers of carbonated soft drinks have increased the proportion of

their marketing budgets devoted to promoting non-sugar brands,¹⁴ which can be expected to support the current trend in favour of non-sugar beverages into the future.

The unfavourable taste of early non-sugar sweeteners may have acted as a barrier to the adoption of non-sugar soft drinks; however, improved taste characteristics of modern non-caloric sweeteners and a consequent increase in product quality are now thought to be facilitating the trend in the soft drink market in favour of non-sugar-sweetened beverages.¹⁵ Still, lingering consumer concern about the safety and artificiality of non-caloric sweeteners remains a barrier to acceptance and addressing this concern may be fundamental to maintaining the current trend towards non-sugar soft drinks.¹⁵

Interestingly, penetration data over time for some categories of water-based beverages did not reflect the movements in volume sales. As an example, non-sugar soft drink beverage sales increased over the 15-year period, despite a decrease in penetration evident from 2007 to 2011. A possible explanation being an increase in volume purchased per buying occasion by already identified users, rather than uptake by non-users over that period. Certainly, the use of discounting at the grocery level may be very attractive to established drinkers.

In the context of the current obesity epidemic, the contribution of water-based beverages to sugar intake by Australians is a topical issue. In per capita terms, sugar contribution from total water-based beverages is in long-term decline, falling 17% between 1997 and 2011. Within the category, small increases in sugar contribution from minor segments, such as mixers, energy drinks, sports drinks and sweetened still water, were overwhelmed by the 26% fall in per capita sugar contribution by carbonated soft drinks during this period. The switch from sugar-sweetened to non-sugar carbonated soft drinks is by far the major factor driving the downward trend in sugar contribution from water-based beverages—a trend aligned with recent commodity mapping studies showing per capita sugar consumption in Australia falling between 1999 and 2011.¹⁶

Contrary to common-held perceptions, lower income families continued to purchase less carbonated soft drinks than those with higher incomes. This finding is similar to

that of the previous study¹² and is likely to be linked in some way to limited disposable income. These associations may underlie the temporary and counterintuitive increase in sales of sugar-sweetened soft drinks during 2009, which corresponded to financial stimulus packages post the global financial crisis.¹⁷

In accordance with findings from previous research,¹² soft drinks, energy drinks and sports drinks are popular with younger adults and teens, but less popular with older Australians over 50 years. Older age groups also consumed less bottled water than their younger counterparts, perhaps attributable to a reduced need for portable options and a preference for tap water.

The major strength of the present study is the longitudinal nature of the data and the 15-year time frame. Limitations include the lack of data for fruit juices and milk-based drinks.

Shifts in consumer purchasing patterns of water-based beverages provide long- and short-term estimates of consumption patterns and may be used by health professionals and agencies for informed decision-making.

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Authorship

G.S. Levy collected and analysed the data and wrote selected sections of the paper. W.S. Shrapnel assisted with data interpretation and wrote selected sections of the paper. Both authors edited the work and prepared it for submission.

Conflict of interest

Both Dr Levy and Mr Shrapnel were paid a consultancy fee by the Australian Beverage Council Ltd to conduct this analysis of the Nielsen data and report on their findings.

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