HEALTH EDUCATION RESEARCH

# Can even minimal news coverage influence consumer health-related behaviour? A case study of iodized salt sales, Australia

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# Abstract

Lack of iodine in the diet can cause a spectrum of conditions, known as iodine deficiency disorders (IDD). While iodized salt has been retailed in Australia since the 1960s, sales have remained low, at ~10% of total edible salt sales. Salt has never been promoted, advertised or discounted by retailers or manufacturers. Extensive news coverage of health issues has often been shown to influence consumer behaviour. But can even modest news coverage generate changes in consumer health-related behaviour? We report a significant increase (5.2%) in national iodized salt sales after a brief period of television and newspaper reports about IDD and the benefits of using iodized salt during and after the Australian National Iodine Nutrition Study in 2003 and 2004. We conclude that even brief news media exposure can influence health-related decisions.

# Introduction

Intensive and extensive news coverage of health issues has often been shown to influence consumer behaviour. For example, widespread negative reporting of the adverse effects of hormone replace-

School of Public HealthUniversity of Sydney, NSW 2006, Australia \*Correspondence to: M. Li. E-mail: muli@health.usyd.edu.au ment therapy saw dramatic decreases in usage [1, 2]. Publicity about celebrities' preferences for breast-conserving surgery has been associated with reductions in radical mastectomy [3]. Large-scale news reports on the singer Kylie Minogue's breast cancer generated a sustained 101% increase in 'never-screened' women booking for mammograms [4]. Prominent and explicit coverage of suicide has been shown to stimulate 'copycat' behaviours [5]. In these examples, news coverage of the relevant issues was typically extensive. But can even modest news coverage of the degree typical of most transitory news reports which span only 1-2 days [see database of all (>711,000) healthrelated news items broadcast on five Sydney freeto-air television channels from 2 May 2005 to 18 February 2007 which shows typical 'life cycle' of a news story is 1-2 days at http://tobacco.health. usyd.edu.au/share/TV.xls] generate changes in consumer health-related behaviour? While health promotion best practice emphasizes the importance of multi-channel extensive media campaigns, these require large funding resources, typically beyond the budgets of many single-issue health promotion non-government and community-based agencies which, however, are often well positioned to generate news coverage [6]. Aggregated news coverage of health issues often greatly exceeds purchased campaign media time, and is neglected as a focus for research, seen often as mere 'background noise' [7, 8]. In this paper, we examine changes in sales data for iodized salt in Australia, and its apparent association with modest news coverage.

Lack of iodine in the diet can cause a spectrum of conditions, collectively known as iodine deficiency disorders (IDD). While goitre is the most recognizable

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manifestation of iodine deficiency, the most devastating effect of iodine deficiency is damage to the developing brain, which can lead to poor school performance, impaired intellectual ability, reduced working capacity and cretinism [9]. There are an estimated 2 billion people worldwide at risk of iodine deficiency [10]. Iodine fortified salt has been used since early last century as a simple and effective way of supplementing diets deficient in iodine and eliminating IDD. Nearly 100 nations around the world have legislated universal salt iodization, where all edible salt is fortified with iodine [11].

In Australia, goitres have been reported in Tasmania and along the Great Dividing (mountain) Range from Queensland to Victoria on the mainland. The major natural dietary sources of iodine are seafood and crops grown in iodine rich soil. Historically, Australians have also acquired iodine from milk and other dairy products via residues from iodinecontaining sanitizers used by the dairy industry [12]. Iodized table salt has been retailed since the 1960s; however, sales have generally remained low, comprising  $\sim 10\%$  of total ex-factory edible salt sales. There have been no government or non-government agency campaigns to promote iodized salt, and salt is never advertised, promoted or price discounted by supermarkets or manufacturers, providing a unique opportunity to examine exogenous influences on sales. Dietary sodium has received considerable negative publicity over the past 20 years in efforts to control hypertension [13]. One manufacturer, Cerebos, holds a 76% share of the Australian retail salt market via its Saxa brand. The remaining market share is held mostly by generic (no-name) supermarket home brands and imported brands.

Recently several epidemiological studies have revealed the reemergence of iodine deficiency in Australia, as indicated by low urinary iodine excretion levels, in schoolchildren and other population groups [14]. Urinary iodine excretion is a very good surrogate marker for iodine intake. A National Iodine Nutrition Study (NINS) of >1700 schoolchildren between 8 and 10 years of age was conducted in mainland states from mid-2003 to December 2004 and attracted modest news media coverage, including a science documentary (Catalyst) broadcast nationally in November 2005 [15]. In addition, various low-reach educational initiatives were undertaken in the period by those involved in the study (see Table 1). The main messages in the media coverage were key facts about IDD and its prevention via iodized salt consumption. Television coverage included scenes of individuals with cretinism and goitres (see Table 2).

The purpose of this study was to determine whether brief news media exposure of the NINS and IDD had any impact on the sales of iodized salt in Australia. We make the assumption that sales of salt are a reliable proxy for salt use, given the staple nature of salt in the typical Australian diet.

# Methods

Data on national iodized salt sales were extracted from the Synovate AZTEC grocery data processing data set provided by Cerebos. AZTEC data are obtained from national point-of-purchase bar code scanning for all brands of iodized salt from all major supermarket stores and independent stores throughout Australia. It is estimated that 99% iodized salt sales are thus captured, missing only some small stores. The Factiva database of content in all Australian metropolitan and regional newspapers was searched for "iodine" from 1 January 1997 to 30 April 2006 and all stories relevant to dietary iodine and iodized salt retrieved. Cerebos (Australia) provided records of all televised coverage of the issue for the same period.

To assess whether there was any difference in the number of units of iodized salt sold before and after each television news exposure, a Poisson model was fitted to the data by using SAS PROC GEN-MOD. The beta estimate (RR), the 95% confidence intervals (CI) and the corresponding probability values were computed.

## Results

# Media coverage

Between 1 January 1997 and August 2003, 16 newspaper articles across Australia (average 2.4/year)

Table I.	Media	coverage	and other	promotion	of the	NINS an	d the	importance	of	iodized	sali
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Television reports

21 September 2003: National Nine News Sydney (estimated audience: 575 000)

5-6 September 2005: National Nine News Sydney on both days plus repeated on Nightline (estimated audience: 367 000)

4 November 2005: ABC Catalyst (national broadcast. Estimated 1 003 388 audience from 24.6% of households) Total in 27 months: four items

Metropolitan and regional newspaper articles

January 1997 to August 2003: 16 (10 from Tasmania)

September 2003 to October 2003: 10

November 2003 to August 2005: 13

September 2005 to December 2005: 19

Total in 9 years: 58 articles

Brochures

3000 brochures on the importance of iodine in diet distributed to school children's families in schools selected for the national study 270 persons visited an information booth in western Sydney during National Thyroid Week 2005 and received information about iodine

Table II. Key messages and resonant images about IDD presented in the media coverage

IDD such as goitre, cretinism and mental retardation are easily prevented (coverage showed people with goitres and characteristic cretin appearance)

Schoolchildren affected by IDD have lower intelligence and can experience learning disabilities

Pregnant women who get enough iodine are more likely to prevent miscarriage and give birth to healthy babies Iodized salt should be used to prevent IDD

A transcript of the ABC Catalyst program can be found at http://www.abc.net.au/catalyst/stories/s1497255.htm

mentioned low iodine intake, with 10 of these published in the island state of Tasmania (which has 2.3% of the Australian population). Around the launch of the NINS project (September/October 2003), 10 articles were published. This coincided with the publication of a paper in the Medical Journal of Australia on low urinary iodine levels in schoolchildren [16], which generated seven out of the 10 reports retrieved. From November 2003 to August 2005, 13 newspaper articles were published. Finally, surrounding the Nine News and ABC Catalyst TV programs between September and December 2005, 19 newspaper articles were identified. This also coincided with the publication of a paper on low iodine intake in pregnant and lactating women [17], which was reported in eight newspaper articles (see Table 1).

## Salt sales

The trend of national iodized salt sales in the period from 1997 to 2006 shows increased sales. However,

the most noticeable increase commenced after 2003 when news publicity increased and involved television, albeit at the modest way described. Figure 1a shows that national iodized salt sales in Australia were increasing by an average of 5% per year before 2003 (RR = 1.05, 95% CI = 1.04–1.06, P < 0.001) and increased by an average of 10% per year after 2003 (RR = 1.10, 95% CI = 1.08–1.12, P < 0.001). The ratio of pre-to-post 2003 trends differs statistically (RR = 0.95, 95% CI = 0.94–0.97, pseudo- $R^2$  = 0.832, P < 0.001). The pseudo- $R^2$  suggests that the underlying trend explains a substantial amount of variability in iodized salt sales.

Furthermore, comparing the two periods, pre (before 2003 news coverage) and post (after 2003 news coverage), it is evident that the number of units (packs) of iodized salt purchased per year by consumers has increased significantly (RR = 0.83, 95% CI = 0.81-0.85, P < 0.001, Fig. 1a).

Particularly significant increases occurred in the number of units of iodized salt sold following the



Fig. 1. Comparison of observed and Poisson regression in iodized salt sales in relation to television coverage of the NINS for the period (a) 1997–2006 and (b) March 2005 to April 2006.

2005 television coverage of the NINS by Nine News and ABC TV's Catalyst. Figure 1b shows iodized salt sales per month between March 2005 and April 2006 (two vertical lines), for pre (before 5 September 2005) and post Nine News (after 6 September 2005, RR = 0.87, 95% CI = 0.81–0.92, P < 0.001); for pre and post Catalyst program (before and after 4 November 2005, RR = 0.84, 95% CI = 0.79–0.90, P < 0.001). Purchase of iodized salt in the month immediately after the heavily promoted Catalyst science program on IDD 'The man who saved a million brains', which was viewed by a quarter of Australian households, increased by 73 000 units, representing a 5.2% rise in sales volume nationwide.

In total, there was a 29% increase in the volume of iodized salt purchased by consumers between September 2003 and April 2006.

There was no significant change in the national iodized salt sales data before and after the 21 September 2003 Nine News coverage, when the NINS was reported for the first time (RR = 0.93, 95% CI = 0.96-1.01, P < 0.07, figure not shown).

Although the rise in iodized salt sales was closely associated with the television exposure, newspaper coverage of iodine deficiency-related reports also increased after September 2003 when the NINS study was launched. Nationally, 58 newspaper articles were published in the 108-month period January 1997 and December 2005. Sixteen were published before September 2003, while 42 were published after September 2003. However, other than the two clusters in earlier October 2003 and early September 2005 with seven and eight reports, respectively, stimulated by the publication of two papers in medical journals, the press coverage was scattered, both in time and place.

# Discussion

Until recently, Australia was perceived as being iodine sufficient, but the NINS study results show that about half of all Australian children have inadequate iodine intake [15], placing Australia among nations with iodine deficiency. Iodized salt has been readily available in grocery stores and supermarkets for close to half century in Australia. However, the consumption of iodized salt by Australians has been low despite the slow rise in the number of units sold since 1997 (the earliest date for which we were able to obtain data). This may be partially attributed to the rise in the Australian population. Market research data from 2003 shows that only 11% of Australian households purchase iodized salt (Source: AC Nielsen Poll. SALT Market Overview Homescan Data to July 2003). Marketing data suggest that the main reason for this is that consumers are unaware of the difference between regular table and iodized salt (Source: study conducted by Smart Marketing, September 2003), as there has never been any public

education about the benefits of iodized salt. With the very limited news publicity arising from the NINS, there was a very positive impact on the purchase of iodized salt, which increased by 29% in volume (units) in the past 3 years nationwide (February 2003 to February 2006).

Our study suggests that even brief episodes of news coverage can influence the public's healthrelated purchasing behaviour. When we overlay television news coverage and the iodized salt sales data in the same time period (Fig. 1b), we were able to show a rise in sales in the weeks immediately following the television items, indicating that television coverage was most likely the factor associated with increased purchasing of iodized salt. In contrast, newspaper coverage was intermittent in both time and location, apart from the two clusters surrounding the publication of two research reports in medical journals. We suggest that while newspaper coverage may have played a part in the overall upward sales trend, its role in relation to the distinctive rise around November 2005 (Fig. 1b) was limited.

Customers responded to the media coverage unevenly. There are a number of possible explanations for this observation. First, the reach of the four television coverage was different. The three Nine News reports were viewed only in the Sydney Nine News broadcast footprint area, and the coverage was brief. The increased sales were recorded mostly in New South Wales. In contrast, the Catalyst program was broadcast nationally, and the increased sales were much broader.

Our study was stimulated by the availability of longitudinal national data on iodized salt sales, which showed an apparent acceleration of sales after news publicity on IDD commenced, and the unusual circumstances of iodized salt, which unlike almost all other products, is never advertised, promoted or price discounted, thus reducing the possible role of these factors in explaining a rise in sales. As our study was not a randomized controlled trial, there remain limitations on the extent to which our conclusions about the power of brief news coverage to change behaviour can be described as definitive. However, we can conceive of no other plausible explanation for the increases we have reported.

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# **Conflict of interest statement**

None declared.

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