Infant food marketing strategies undermine effective regulation of breast-milk substitutes: trends in print advertising in Australia, 1950–2010

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Abstract

***Objective*:** This study addresses the issue of whether voluntary industry regulation has altered companies' marketing of breast-milk substitutes in Australia since the adoption of the World Health Organization (WHO) International Code on the Marketing of Breast-milk Substitutes 1981.

***Methods*:** Print advertisements marketing breast-milk substitutes were systematically sampled from the Australian Women's Weekly (AWW) magazine and the Medical Journal of Australia (MJA) for the 61 years from 1950 to 2010.

***Results*:** Breast-milk substitute advertising in both the MJA and the AWW peaked and began declining before the introduction of the WHO Code in 1981. Although there was almost no infant formula advertising in AWW after 1975–79, other breast-milk substitute advertising has been increasing since 1992, in particular for baby food, toddler formula and food and brand promotion.

***Conclusions*:** Companies have adopted strategies to minimise the effects of the Code on sales and profit in Australia, including increasing toddler formula and food advertisements, increasing brand promotion to the public, and complying with more limited voluntary regulatory arrangements.

***Implications*:** Comprehensive regulation is urgently required to address changed marketing practices if it is to protect breastfeeding in Australia.

Key words: infant formula, infant food, marketing, bottle feeding, World Health Organization

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This study addresses the question of whether voluntary regulation of breast-milk substitutes (BMS) has altered advertising trends and patterns since its introduction around three decades ago, and subsequently protected the practice of breastfeeding, as was its intention.

Breast milk is a complete source of nutrition for the first six months of life, and a valuable contribution to a healthy diet for young children. The World Health Organization (WHO) recommends continued breastfeeding to two years of age and beyond after the introduction of solid food.[1] In Australia, the *Infant Feeding Guidelines* recommend exclusive breastfeeding until around six months and continued breastfeeding to 12 months and beyond.[2]

Premature weaning from exclusive breastfeeding is accepted to confer a heightened risk of several infectious illnesses in infancy.[2] It has also been associated in many studies with an increased risk of Sudden Infant Death Syndrome[3] and chronic disease in the longer-term, including obesity.[4-6] A large cluster randomised trial by WHO has shown poorer cognitive development at aged six years for infants experiencing earlier weaning.[7] Impacts on mothers increase with reduced exclusiveness and duration of breastfeeding, and include higher risk of some cancers including breast and ovarian cancers.[4,8] The wider, health system cost of early weaning is now well recognised, including by the 'Best Start' Parliamentary inquiry into the benefits of breastfeeding.[9]

National targets – for 80% of infants to be fully breastfed for around six months[2] – remain elusive. The Australian Infant Feeding Survey[10] recently found current breastfeeding initiation rates of 96%. Compared to past breastfeeding trends,[11] this represents the highest recorded initiation rate since 1939. However, the short duration of breastfeeding continues to be a significant problem. In 2010, only 42% of infants between six and 12 months received any breast milk, and only 7% of toddlers at 19–24 months.[12] This follows a general upward trend in consumption of commercial infant milk between 1939 and 1998.[11] Premature introduction of both formula and solids remains high.[10]

Infant food marketing has been identified as a barrier to improving breastfeeding duration in Australia, alongside the rising labour force participation by new mothers.[13] Employed mothers have increased risk of early weaning from breastfeeding.[14] Market research attributes rapid growth in the formula market in 2011 to high economic growth rates "and its corollary the growing number of working women"[15] (p.3).

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The WHO *International Code on the Marketing of Breast-milk Substitutes* (the 'WHO Code') introduced in 1981 recognised that in view of the "vulnerability of infants in the early months of life and the risks involved in inappropriate feeding practices, including the unnecessary and improper use of breast-milk substitutes, the marketing of breast-milk substitutes requires special treatment, which makes usual marketing practices unsuitable for these products".[16] In 1979, WHO had convened a meeting at which government, consumer and industry delegates agreed to stop the promotion of BMS to the public.[16] In 1981, this was formalised as the WHO Code.[16] Compliance was voluntary but the Code proscribed all marketing of BMS and bottles and teats to the public, and restricted advertising to health professionals.[16] The aim of the Code was to "[protect] and [promote] breastfeeding … by ensuring the proper use of breast-milk substitutes … through appropriate marketing and distribution".[16] While recognising a legitimate market for BMS, the Code sought to ensure products were not marketed and distributed to mothers and health professionals in ways that interfered with breastfeeding. In 2003, the World Health Assembly (WHA) members unanimously agreed to the 'Global Strategy for Infant and Young Child Feeding',[17] which stated that "infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years or beyond" (p.8), thus effectively extending the agreements to restrict marketing of toddler foods and formulas.

In Australia, a 1983 industry agreement disallowed direct advertising of infant formula by manufacturers and importers to the public, but continued to allow almost all other advertising.[18] Public advocacy for greater alignment with the WHO Code[18] resulted in the Marketing in Australia of Infant Formulas: Manufacturers and Importers Agreement of 1992 (MAIF Agreement). The 1992 Agreement was deemed to apply to formula for infants up to 12 months of age.[19] It prohibited marketing to the public and placed restrictions on marketing to health professionals, including the requirement that claims be scientific, and forbidding the use of free supplies or incentives. However, it applied only to manufacturers and importers, not retailers, and exempted all bottles and teats, and infant food and drinks (excluding infant formula).[19] 'Toddler formula' was also excluded. The Agreement is a self-regulatory, voluntary code monitored by the Advisory Panel on the Marketing in Australia of Infant Formula (APMAIF), selected by the Commonwealth Department of Health and Ageing. All six major infant formula manufacturers are signatories.[20]

In 2007, the Commonwealth Parliament House of Representatives Standing Committee on Health and Ageing considered evidence on the effects of commercial marketing on breastfeeding decisions. Its *Best Start* report concluded that full implementation of the World Health Organization International Code of Marketing of Breast-milk Substitutes (WHO Code) was needed to increase breastfeeding to adequate levels in Australia (Recommendation 22).[9] However, the National Breastfeeding Strategy agreed by Australian Health Ministers in November 2010[21] stated that breastfeeding protection including restrictions on marketing of infant formula was one of several "complex issues that do not lend themselves to immediate solutions" (p. 24). In late 2011, the federal Department of Health and Ageing commissioned a study on the implementation of the WHO Code in Australia including the effectiveness of the MAIF Agreement in achieving its aims. In July 2013, the consultant's report was released.[22] It recommended no change to the voluntary industry self-regulatory model, no change to the scope of the MAIF, and no extension of MAIF to formulas marketed for toddlers. Instead, the report recommended 'consideration' of restricting labelling of toddler milk drinks so consumers could distinguish these from infant formula, but this was ruled out by the Department in releasing the report. That is, five years on, no significant action has been taken, nor now seems likely to be taken, to implement the 2007 recommendation of the Australian Parliamentary Committee that the WHO Code be fully implemented in Australia.

The effect of breast-milk substitute advertising on breastfeeding

According to the WHO Code, 'marketing' of BMS includes "product promotion, distribution, selling, advertising, product public relations, and information services".[16] Common marketing mediums include print, television, information help lines, online promotion, point of sale advertising and free supplies.[23] In the past decade, new communications technology has provided a range of alternative avenues for promotion and marketing.[24] Prohibited marketing may overtly state or just imply the 'naturalness' of the products, ease-of-use and equivalence or superiority compared to breast milk.[23]

It has long been known that marketing may subtly bias choices by shaping perceived social norms concerning alternatives to breastfeeding, and creating a distorted view of what is the most 'scientific' or optimal food for infants.[23] Recent research in neuroeconomics highlights how marketing might take advantage of normal neurological processes to increase the likelihood of consumer 'mistakes', manipulating choice contexts to increase time pressures or stress, and influencing how much emphasis is given to various product attributes in consumer decision-making.[25]

Methodologically, the effect of commercial marketing on breastfeeding is difficult to isolate.[26] Several studies, including a randomised trial, point to adverse effects of marketing on breastfeeding exclusivity and duration.[11,27-29] Marketing to health professionals, who have been found to be a major influence on mothers' infant feeding decisions, is suggested to promote BMS use.[23] High rates of brand recognition have also been shown to be linked to reduced breastfeeding.[30] Advertising of solid foods and toddler formulas directly reduces breastfeeding rates through promoting premature weaning from exclusive breastfeeding, and by cross-marketing infant formula.[26,28] A number of researchers have also examined media messages on infant feeding using content analysis,[31,32] including in Australia.[33] Few studies[28,34] have specifically focused on how commercial marketing strategies respond to public controversy on infant food marketing, or to threats of regulation of marketing.

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To inform public policy discussion of this issue, this study looks at trends and patterns in print advertising of breast-milk substitutes in Australia before and after the signing of the WHO Code in 1981. We aimed to identify the impacts of voluntary regulation of marketing by industry through the 1992 MAIF Agreement, and contrast this with the objectives underpinning the WHO Code itself.

We hypothesised that the level and nature of advertising would alter in response to public controversies such as those preceding the adoption of the WHO Code. We also expected that companies would modify their marketing and adopt strategies that minimise the effects of such constraints on marketing, sales, and profitability, but are just sufficient to avoid effective public regulatory restrictions.

Method

This study used quantitative analysis to capture long-term changes in the volume and product composition of print advertising of BMS to mothers and the health professionals to explore how marketing strategies have responded to changes in public and medical opinion and the regulatory environment. Other quantitative studies of magazine content in the US have examined the frequency of messages about infant feeding, and the apparent impacts on women's decisions.[29,31]

Women's magazines are used by pregnant women to gain information about infant care and parenting issues. Partly as a result, the medical profession have come to be seen as 'experts' in the 20th Century era of 'scientific mothering'.[31] Hence, a popular public magazine – the *Australian Women's Weekly* (AWW) – and a health professional journal – the *Medical Journal of Australia* (MJA) – were chosen to observe marketing trends given their differing target audiences, and the specific WHO Code and MAIF Agreement restrictions for each group.

The AWW and MJA were selected because their long-running circulation allows for time series analyses of advertising trends: print advertisements were collected from January 1950 to December 2010 (61 years). Additionally, the popularity of the AWW and MJA meant they are likely to reflect the content of other publications targeting similar audiences. In July to December 2011, AWW had a printed circulation of more than 470,000.[35] In September 2011, MJA printed circulation was 29,587, with many more online visits.[36]

The years 1950–2010 were chosen for sampling because this period covers major increased industry competition and supply that occurred in Australia during the mid-1950s, changes to birth practices and breastfeeding patterns and women's work practices (demand) from the 1960s, and major changes in regulation and public opinion from the beginning of the 1970s.[18,23]

The scope of data collection included all text or pictorial advertisements considered to market BMS, as defined by the WHO Code, whether this was directly stated, or just implied in the advertisement. BMS are defined as "any food being marketed or otherwise presented as a partial or total replacement for breast milk, whether or not suitable for that purpose".[19,37] This includes all food and formula marketed for children of an age where breastfeeding is recommended (less than two years of age),[1] including infant food, infant formula, toddler food and follow on or toddler formula, as well as bottles and teats, sterilising solution, breastfeeding aids and general brand promotion. Toddler food and toddler formula advertisements were collected after 1980, though not evident previously.

Excluded were infant feeding implements other than bottles, as these were not a major focus of the study. Also excluded were advertisements by formula companies for non-BMS products, although these may cause some cross-promotional marketing and products considered to be medical treatments. Definitions of included products are shown in Table 1.

Sampling strategy

A previous collection of data on advertising of infant milk and formula products covers the period 1950–1985.[11] For the present study, the above data collection was extended to 2010 using comparable sampling methods.

To maintain a manageable sample size, data was collected from all issues of the MJA in every fifth year. For the AWW, advertisements were also collected using systematic sampling. Data was collected from all issues in January, May and September of every fifth year from 1950 to 2010. A similar strategy has been used elsewhere in analysis of *Parents' Magazine* content.[29,31] Data was also collected

Table 1: Definitions used for classifications of products in this study.

Infant formula	Modified non-human milk products described or sold as an alternative for human milk for the feeding of infants up to the age of twelve months.[19] NOTE: This includes 'follow-on' formula which is suitable for infants aged 6 to 12 months and condensed, concentrated and evaporated milks marketed as being suitable for infants less than 12 months or products marketed as making non-human milk suitable for infant consumption.
Toddler formula	Modified non-human milk products marketed or presented as being appropriate for children 12 months or older.
Baby food	Food (solids or liquids) presented as a source of nourishment for infants up to 12 months of age, NOTE: for clarity of exposition, the definition of infant food in this paper excludes infant formula, though this is not common usage.
Toddler food	Food (solids or liquids) presented as a source of nourishment for infants older than 12 months of age.
Bottles/teats	Bottles or teats designed for hand-feeding of infants less than 12 months of age
Sterilizing solution	Sterilizing solution designed for infant bottle cleaning
Breastfeeding aid	Supplement or other formulation marketed as enhancing lactation.
Brand promotion	Marketing where specific products are not the focus but a brand is being marketed in relation to artificial infant feeding, such as a competition or a baby care helpline.

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from the January issue in all other years over that period, so that advertisements appearing in January have a higher probability of inclusion than other months. January was selected because this month often contained special feature articles of interest to new mothers and more regularly contained advertisements for baby products. This approach was directed at achieving systematic but efficient sampling over an extended time period within tight resource constraints,[38] while also allowing for representation of seasonal differences in the volume of advertising per issue by the sampling of some May and September issues.

Every weekly issue before 1983 was sampled from target months, but since the AWW became a monthly in January 1983, only the single monthly publication was sampled.

Data collection, coding and analysis

Data were collected through hand-searching of volumes from the National Library of Australia. BMS advertisements found were photocopied or scanned for storage. These were coded into categories as discussed above and in Table 1. Individual advertisements could be allocated to a maximum of two categories if they promoted more than one product. Those that advertised more than two categories were considered 'general brand promotion'. The publication, date and category of each advertisement were recorded in Microsoft Excel.

The volumes of advertisements before and after the WHO Code were compared for each of the publications. We also analysed changes in the number and proportion of advertisements in each category. The period from 1980 onwards was considered to be 'post-Code', as provisional agreements were made in 1979.[37]

Results

Trends in total BMS advertising

A total of 238 AWW issues and 478 MJA issues were examined. Using the inclusion criteria above, 223 advertisements were identified in the AWW and 123 advertisements in the MJA.

As shown in Figure 1, advertising in the AWW peaked with 50 advertisements in 1970–74, before the Code was introduced. After the Code was introduced, AWW advertising began falling between 1985 and 1989 and fell further to a minimum of four advertisements in 1990–94.

Advertising in the MJA peaked earlier, with 41 advertisements in 1965, after which there was a steep decline until 1975, well before the introduction of the WHO Code. After 1990, advertising in the MJA declined, and there were no advertisements recorded after 1995.

However, advertising in the AWW increased from four advertisements between 1990–4 and 2005–09 to 23 advertisements in 2005–09, a more than five-fold increase (575% increase). This is the largest volume of advertising observed since the Code was introduced.

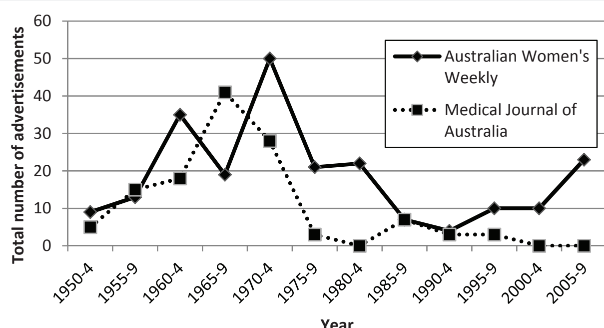
Product composition of advertising

Infant formula made up the majority of advertisements for BMS for all years in which BMS were advertised in the MJA. Volume of infant formula advertising peaked in 1965 with 27 advertisements. Levels after the WHO Code were lower, with a maximum of seven in 1985. No infant formula advertisements were recorded after 1995. There was little other advertising in the MJA.

Unlike the MJA, BMS advertising in the AWW was predominately for baby food not formula. Before the Code was introduced, baby food excluding infant formula comprised the greatest contribution to BMS advertisements at 43% of total advertising (63 advertisements), and infant formula an additional 20% (30 advertisements) (Table 2). The decline in baby food advertising began around 1970–74. After the Code was introduced there were fewer baby food advertisements (17 advertisements, 22% of the total). However, since 1990–94, when there were no advertisements, baby food advertising has slowly increased (to five advertisements in 2005–09).

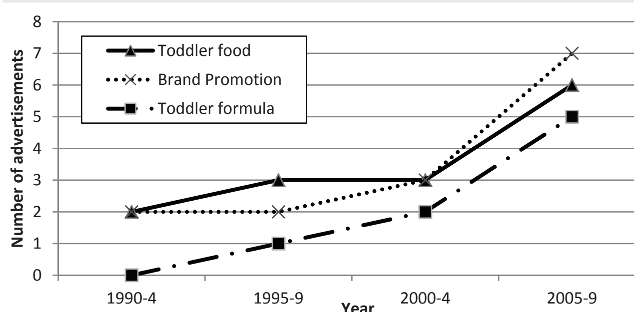
Infant formula accounted for just 20% of all BMS advertising before 1980 (Table 2). After this time, just one infant formula advertisement was recorded, in 1995 by Wyeth.

Figure 1: Comparison of longitudinal trends in volume of breastmilk substitute advertising between *Medical Journal of Australia* and the *Australian Women's Weekly*, 1950-2009.



MJA, n=123 advertisements, AWW, n= 223 advertisements.

Figure 2: Growing markets: advertising for toddler food, brand promotion and toddler formula in the *Australian Women's Weekly* 1990-2009.



Toddler formula, n= 8 advertisements, toddler food, n= 14 advertisements, brand promotion, n=14 advertisements.

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Increase in other BMS advertising since WHO Code

As in Table 2, 37% of pre-Code advertisements and 77% of post-Code advertisements were for products other than infant formula and baby food. Bottles, teats and sterilising solution advertising peaked in 1970–74 with 19 advertisements, then declined until none were recorded after 1989.

Toddler formula first appeared in 1995 and toddler food in 1987. The 450% increase observed in advertisement of ‘other’ products in the past 15 years in the AWW was roughly equally spread between brand promotion (39%), toddler food (33%) and toddler formula (28%) (Figure 2).

Discussion

The level and nature of BMS advertising to mothers and health professionals changed following the expression of public concern at unethical marketing of infant foods during the 1970s; concerns that culminated in the WHO Code in 1981. Both trends peaked and began to decline prior to the introduction of the WHO Code. There was an earlier peak in MJA, and very little advertising in MJA post-Code. This indicates that as expected, companies’ advertising responded to public or health professional opprobrium, as well as perhaps in anticipation of, and to avert, public regulation. However, compliance with voluntary regulation is not complete;[20] individual corporations have strong strategic incentives to break agreements in order to enter new markets, introduce new products, or exploit new avenues for promotion and marketing.

It could also be expected that the companies would adopt strategies to minimise the effects of the Code on sales and profit, and this is supported by AWW data. Baby food advertising, while covered by the WHO Code, continues to be present in AWW. Although post-Code there was almost no infant formula advertising in AWW, total BMS advertising is increasing, in particular for baby food, toddler formula and food and brand promotion. This expectation was not proved to be true in MJA, where no BMS advertising was recorded after 1995.

The earlier peak in advertising in MJA is supported by Thorley[23] and Minchin[18] who reported that most infant formulas and milks were marketed directly towards health professionals in the first half of the 20th Century, after which time marketing to mothers increased. Similarly, the drop in advertising in the AWW in 1965–69 – the peak period for advertising in the MJA (1965) – may indicate that marketing was being redirected towards health professionals at this time. The subsequent drop in the MJA may coincide with the rise in health professionals speaking out against infant formula, which increased rapidly from the mid-1960s, as the benefits of breastfeeding became more widely accepted.[39] Reduced print advertising to health professionals may also reflect promotion and expanding sales in product markets which are perceived as less contentious. Examples include the success of industry advocacy for new dietary guidelines to recommend feeding only commercial formula (and not other forms of cows’ milk) to non-breastfed infants in the first year[18] and the sponsoring of health professional conferences.[40]

Minchin’s review of marketing practices reports there was no direct advertising of infant formula to the public from 1979 until the Mead-Johnson campaign of 1991.[18] The lack of any formula advertising in AWW 2000–09 is consistent with the maximum of one breach recorded per year by APMAIF since 2001.[20]

The large increase in toddler formula advertisements in the AWW since the Code aligns with Australian research by Berry et al.,[26,28] which found more advertising of toddler formula and follow-on formula (where permitted) in Australia and other countries where infant formula advertising was not permitted. This Australian research is supported by a 2012 UK analysis which also found that “consumers recall follow-on advertising as advertising for infant formula”.[34] The German Federal Institute for Risk Assessment recently commented that toddler formula is “superfluous” in a balanced diet, and may have adverse long-term health consequences due to an “oversupply of nutrients”.[41]

Table 2. Comparison of numbers of advertisements and proportions of categories of breastmilk substitutes before and after the WHO Code in the *Medical Journal of Australia* and the *Australian Women’s Weekly*.

	MJA				AWW			
	Pre-Code**		Post-Code***		Pre-Code**		Post-Code***	
	No.	%	No.	%	No.	%	No.	%
Infant formula	84	76	12	92	30	20	1	1
Baby food	16	15	0	0	63	43	17	22
Brand promotion	7	6	0	0	4	3	17	22
Breastfeeding aid	3	3	0	0	3	2	0	0
Bottles/teats	0	0	0	0	24	16	12	16
Sterilising solution	0	0	0	0	23	16	5	7
Toddler food*	NA	NA	0	0	NA	NA	16	21
Toddler formula*	NA	NA	1	8	NA	NA	8	11

**Advertisements for toddler formula and food were collected from 1981-2010 only. Pre-Code MJA, n= 110 advertisements, Post-Code MJA, n= 13 advertisements, Pre-Code AWW, n= 147 advertisements, Post-Code AWW, n= 76 advertisements. **Pre 1980 considered ‘Pre-code’. ***Post 1979 considered ‘Post-Code’.*

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Mechanisms

Changes in public and professional opinion

While more advertising to health professionals is allowed under the Code than to the public,[16] less advertising was found in the MJA compared to the AWW. Thorley[23] suggested that manufacturers shifted from marketing to health professionals to find new markets in mothers. This may have been due to health professional marketing becoming less effective, as a review found that post-Code there was increased dissemination of information on dangers of infant formula to health professionals, as well awareness of their obligations under the Code and the need to encourage breastfeeding within the field.[2,42] By August 1971, the American Journal of Clinical Nutrition had a special issue on the benefits of breastfeeding compared to bottle-feeding.[43]

The decline in the late 1970s in the AWW coincided with an increase in breastfeeding advocacy,[44] and a public backlash over perceived irresponsible marketing practices culminating in the Nestlé boycott beginning in 1977.[18] This may be evidence of an important effect of public opinion on marketing practices.

The MAIF Agreement: an effective regulatory choice?

The decline in infant formula advertising, despite the increase in total BMS advertising, suggests that the MAIF Agreement helped to secure compliance with part of the WHO Code. Such a decline is not evident in the comparable US study.[29] However, the continued marketing of baby food, which is clearly prohibited by WHA amendments,[45] and the decline in BMS advertising pre-Code raises the question: is the MAIF Agreement the most effective response for reducing BMS marketing and promoting breastfeeding in Australia?

According to the Australian Competition and Consumer Commission (ACCC), voluntary codes of conduct, such as the MAIF Agreement, have the advantage of being able to respond quickly to changing industry needs.[46] Other acknowledged benefits to the government include reduced costs of administration and of changing policy if costs are met by industry and for harbouring a "responsible spirit" and therefore cooperation of the industry.[47] Benefits to industry include improving its public image and a low impact on marketing, as well as the likelihood of discouraging harsher, more comprehensive legislation.[48]

However, voluntary codes of conduct, particularly in the case of tobacco advertising, have repeatedly been shown to produce suboptimal results.[48] A report by the World Bank found that bans on advertising of tobacco are only effective if they include brand names and logos, as partial regulations cause companies to shift advertising spending.[49] Although tobacco and BMS are clearly different products, the observed behaviour of tobacco companies is consistent with that seen in Australian BMS marketing.[50]

The insufficiency of the MAIF Agreement to protect breastfeeding is indicated by the increase in print BMS advertising in the AWW after 1992. In particular, the increase in toddler formulas signals that Australian infant formula manufacturers are using line extension marketing strategies, using similar packaging and the same brand and logo in their permitted infant food products to indirectly advertise infant formula.[51]

Even more subtle than line extension, is 'brand stretching' marketing, which was not captured by this study. This technique has been documented in studies of internal papers within the tobacco industries of Australia and the UK and involves the labelling of a product in a new market with a well known brand name.[28,52,53] Brand stretching has been found to encourage sales of new products, if customers perceive that the brand is associated with good "image, credibility and reputation".[54] Comparably, an advertisement in the AWW in June 1995 which was excluded from this study depicted a smiling infant alongside the brand name 'Wyeth'. In fact, the advertisment was for a pneumococcal vaccine, however, the association created beween Wyeth and a healthy infant in this context may indirectly promote infant formula through the use of 'brand stretching'.

Increase in non-print marketing

The decline in BMS advertising in the MJA, and the emergence of print advertisements not covered by the MAIF Agreement in both the MJA and the AWW, raises the issue of whether other forms of non-print promotion may have increased. The International Baby Food Action Network (IBFAN) report *Australia: Code violations 2007*[55] noted the persistence of commercial sponsorship of health professional conferences and information pamphlets displaying product ranges to doctors, not covered by the MAIF Agreement. IBFAN has also identified the worldwide emergence of digital and direct marketing of products covered by the WHO Code.[40] The significance of the Internet as a source of health information for parents has been emphasised in a UK study of corporate website advertising of formula products.[34]

Abrahams has also drawn attention to the new and more effective opportunities for promotion and advertising of infant feeding products through companies' exploitation of interactive social media.[24] This study found violations of the WHO Code as well as promotional practices unforeseen by the Code, such as blogs, social networking sites such as Facebook, micro-blogging services like Twitter, content communities like YouTube and collaborative projects like Wikipedia.

The media's portrayal of infant feeding also plays a role in shaping perceived social norms, choice contexts, and influencing the emphasis mothers give to the various attributes of different infant feeding methods. Research has pointed to the increasing use of the media by the pharmaceutical industry to promote its products through 'disease mongering',[56] a strategy evident also for infant feeding.[57]

Implications

The increase in advertising of products, including baby food and toddler food and formula, beyond the scope of the MAIF Agreement but within the scope of the WHO Code, may lead to early weaning and reduced exclusivity of breastfeeding, and undermine efforts

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to increase the duration of breastfeeding. New forms of marketing such as social media and Internet advertising are also unaddressed by current policies. To implement the WHO Code fully, legislation is likely to be needed and effective.[34]

Strengths and limitations of this study

This study covered a period spanning 30 years prior to the Code and almost 30 years afterwards, which allowed for influences on advertising trends beyond the immediate impact of the Code such as the MAIF Agreement to be considered. It also looked at a wide range of products that could directly or indirectly promote BMS use. However, as bottles, teats and sterilising solution may be used either for breast milk or infant formula feeding, the inclusion of advertisements for these products may have falsely increased the recorded volume of marketing promoting BMS use because of increased expressing of breast milk for premature infants or for employed mothers.

Examination of the MJA and AWW allows consideration of advertising trends to both the public and health professionals. The MJA was only sampled every fifth year; extreme transient advertising trends in a sampled year could therefore potentially distort the data. As the AWW was sampled every year in January, but five-yearly for the May and September issues, it is possible that extreme results may be overrepresented if they occurred in January. More intensive sampling of the AWW and MJA is needed for more detailed statistical analysis.

Changes in journal formatting and length during the sampling period may have altered the space available for advertisements and therefore the number and size of advertisements present.

Further research

Further study is needed to determine whether our findings about print advertising trends can be generalised to other forms of BMS marketing over time. This would include and compare trends and patterns of advertising via television and radio, the Internet and social media. There is a need to examine trends for areas not covered by the MAIF such as retail advertising. A discourse analysis of Australian advertising images and text could determine the effect of the Code in combating marketing of product attributes, such as that implying the superiority or 'scientific' advantage of BMS over breast milk. An analysis of the changing content of marketing messages over time may also provide important insights to inform counter-marketing strategies and regulatory strategy. It would be valuable to document the extent of promotion through supporting health professional education, and the level of professional disclosure of support.

It would also be informative to compare the effectiveness of different policy approaches to implementing the Code in various countries and Australia using summary indicators of breastfeeding prevalence, and WHO Code implementation at the country level.

Conclusions

The level and nature of BMS advertising to mothers and health professionals began changing before the WHO Code 1981 following public concern about the issue. Subsequently, companies have adopted strategies to minimise the effects of the Code on sales and profit, including increasing toddler formula and food advertising and brand promotion to the public, including online marketing. This disputes the relevance of the current MAIF Agreement to changing marketing practices and its effectiveness in protecting and supporting breastfeeding.

Despite the limitations of voluntary codes outlined, legislation can only be effective if it is enforced and has social backing.[18,47,48,53] Minchin[18] has highlighted the difficulty in gaining legislative support for public health regulation, observing the difficulty and time taken in obtaining community and legislative support to make laws against tobacco. In the case of BMS, in 2007 a bipartisan committee recommended full implementation of the WHO Code in Australia. However, no action had been taken by the middle of 2013.

This six-year intermission illustrates that a delayed response advantages the industry through ongoing sales and profit, at the expense of more than a million infants whose mothers have been exposed over that period to marketing outside ethical boundaries set by the WHO Code and the World Health Assembly.

A joint campaign by public health and breastfeeding advocacy groups is needed to reinvigorate the Australian Government's response to the inquiry's original recommendation, and ensure that the growing exploitation of online promotion and marketing avenues is urgently and effectively addressed.

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