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SCOPE AND IMPACT OF DIGITAL MARKETING STRATEGIES FOR PROMOTING BREASTMILK SUBSTITUTES



World Health
Organization

Scope and impact of digital marketing strategies for promoting breastmilk substitutes

Scope and impact of digital marketing strategies for promoting breast-milk substitutes .

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Glossary

App: application on a mobile device.

Digital marketing: promotional activity, delivered through a digital medium, that seeks to maximize impact through creative and/or analytical methods (1); coordinated promotional messages (marketing communications) and related digital media used to communicate with consumers in digital environments (2).

Digital media: includes any online or digital means of transmitting marketing communications, including but not limited to, websites, social networking environments, search engine advertisements, banner advertisements, email communications, streaming audio and video, online gaming, messaging services, mobile services and online retail platforms (3).

Brand: a recognizable entity that entails distinctive design elements, such as a brand mark or logo, text or packaging, that adds value to a product. Brands are the perceptions, benefits and experiences that consumers come to associate with certain design elements and the products, services or companies that bear them (4).

Breast-milk substitute (BMS): foods and beverages marketed or otherwise represented to be suitable, with or without modification, for use as a partial or total replacement of breastmilk (5), including any milks (or products that could be used to replace milk, such as fortified soy milk) in either liquid or powdered form, that are specifically marketed for feeding infants and young children up to the age of 3 years (including infant formula, follow-up formula and growing-up milks) (6).

BMS brand: a family brand, or in other words an umbrella brand, applied to more than one BMS products (7). Family brands facilitate cross promotion.

Boosted post: advertisements created from posts on an advertiser’s social media page in order to attract more messages, video views or leads. A lead is a contact with a potential customer, also known as a ‘prospect’ (8). Boosted posts help advertisers reach new people that do not currently follow the advertiser’s social media content (9).

Cross-device marketing: the process of identifying customers across various devices and serving advertisements and information that is designed to render seamlessly on whatever devices a consumer is using to access the web (10).

Cross-promotion: (also called brand crossover promotion, brand stretching) is a form of marketing promotion where customers of one product or service are targeted with promotion of a related product. This can include packaging, branding and labelling of a product to closely resemble that of another (brand extension) (6). This can also be referred to as line extension.

Dark posts: a digital form of direct marketing that enables advertisers to create and distribute advertisements tailored for narrowly selected groups of people to only and exactly those groups of people. These advertisements only appear only in the newsfeeds of those users and do not appear anywhere else (these are also known as unpublished posts) (11).

Digital billboards: Digital screens erected in public places.

Digital Out-of-Home (OOH): marketing whereby advertisers display promotional content, usually advertisements, to digital billboards.

Earned impressions: a measure of digital views or engagements with promotional content. This important benchmark demonstrates the value of promotional content. Earned impressions are high when consumers value it enough to share it consistently AND click through (12).

Engagement: user activity associated with published, branded, user-created content including likes, comments, mentions and shares (13).

Follower: a user who consciously chooses to see all the posts of another user in their newsfeed (14).

Follow-up formula: (also referred to as follow-on formula) a breast-milk substitute marketed as suitable for use as a total or partial replacement for breastmilk in the diet of an infant from 6 months of age.

Hashtag: a word or phrase preceded by the symbol # that classifies or categorizes the accompanying text (15).

Infant formula: a breast-milk substitute suitable for use as a total or partial replacement for breastmilk in the diet of an infant.

Influencer: an individual who generates income (from companies, such as BMS manufacturers) by creating informative or entertaining content to attract followers and disseminate marketing communications to them (16).

Lookalike targeting: targeting that enables advertisers to extend the audience their promotions reach by identifying new people who are similar to those already targeted (17).

Meta-data: data that provide information about other data or content. These data can include information about where, when, or how the content was created, its source, legal or licencing information (18).

Newsfeed: a web page or screen that changes regularly to show new content (also referred to as feed) (19).

Organic posts: advertisements published on the timelines of advertisers’ profile pages. These promotional posts then appear on the timelines (or newsfeeds) of users who follow advertisers’ social media accounts (20).

Social media intelligence platform (SMIP): SMIPs gather, organise and analyse data from the billions of daily exchanges and conversations between social media users around the world and other digital platforms, such as websites and forums (21).

Toddler formula: (also referred to as growing-up milk or young child formula) a liquid breast-milk substitute marketed as suitable for use as a total or partial replacement for breastmilk in the diet of a child from 12 months of age (6).

Vlog: A blog composed of posts in video form (22).



Executive summary

Digital technologies are increasingly used for marketing of food products throughout the world. Growth in breast-milk substitutes (BMS) product sales has eclipsed growth in the global birth rate. The global formula market has been valued at more than US\$ 52 billion. The use of digital platforms by breast-milk substitutes manufacturers and distributors to promote their products is accelerating.

Despite ample evidence that exclusive and continued breastfeeding are key determinants of lifelong health for children, women, and communities, far too few children are breastfed as recommended. Recognizing that inappropriate promotion of breast-milk substitutes negatively impacts on breastfeeding practices, the World Health Assembly adopted the *International code of marketing of breast-milk substitutes* (“the Code”) in 1981. Yet the inappropriate promotion of breast-milk substitutes continues unabated in much of the world and digital technologies have created powerful new marketing tools for the promotion of breast-milk substitutes.

This report was developed in response to a request from the Seventy-third World Health Assembly¹ for a comprehensive report on the scope and impact of digital marketing strategies for the promotion of breast-milk substitutes².

Evidence of exposure to and impact of digital breast-milk substitutes marketing was collected from several sources. These include a systematic review of the literature, social listening research, a multi-country study of mothers’ and health professionals’ experience of breast-milk substitutes marketing, individual country reports of breast-milk substitutes promotions and an analysis of existing legal measures to implement the Code.

Exposure and impact

This evidence demonstrates that manufacturers and distributors of breast-milk substitutes commonly use digital marketing strategies across a wide range of online channels and social media platforms and that the use of digital marketing strategies dramatically increases the reach and impact of breast-milk substitutes promotions. Digital technologies offer advertisers new marketing tools that are powerfully persuasive, extremely cost effective and often not easily recognizable as breast-milk substitutes promotions.

Evidence demonstrates that

- Women are exposed to digital marketing in every country where research investigating this issue has been conducted — in some countries more than 80% of women who reported seeing breast-milk substitutes advertisements reported having seen them online.
- Women who recorded diaries of exposure to breast-milk substitutes marketing in seven countries saw online breast-milk substitutes promotions, on average, between once and seven times a week.
- Women are exposed to highly-targeted content, made visible only to them, which may not be easily recognizable as advertising.
- The 4 million social media posts about infant feeding sampled and analyzed using a commercial social listening platform reached 2.47 billion people and generated more than 12 million likes, shares or comments.
- Collectively, the 264 breast-milk substitutes brand accounts monitored for this research posted content around 90 times per day and reached 229 million users.
- Engagement (the rate of likes, shares or comments) was up to 10 times greater than the rate generally considered to indicate an effective campaign.
- Social media posts that include a reference to a breast-milk substitutes brand or product reach three times as many people as posts about breastfeeding and people are more likely to like, share or click on such posts.
- Digital marketing increases breast-milk substitutes purchases and is better value for money than traditional marketing.

New marketing techniques applied

The digital context offers new opportunities for marketers and makes it possible for advertisers to identify their target audiences with unprecedented precision. This report provides examples of multiple techniques used for the promotion of breast-milk substitutes, including:

- highly-targeted marketing through the application of algorithms driven by internet user data;
- use of parenting apps;
- real-time contact with women;
- virtual support groups or “baby-clubs”;
- use of social media influencers;
- user-generated promotions, such as competitions that encourage users to generate or share promotional content (images or messages);
- publication of information and education about topics of interest to new parents;
- private messaging and provision of professional advice; and
- disseminating content beyond national borders.

In addition, breast-milk substitutes companies continue to use line extension or cross-promotion techniques on digital platforms to circumvent rules prohibiting promotion of infant formula.

Digital marketing techniques enable breast-milk substitutes advertisers to identify pregnant women and mothers in online spaces, identify their deepest concerns by observing or engaging them in conversation, exploit their most vulnerable moments, disguise their marketing content as information or advice and enlist people women respect most to influence their infant feeding choices. Digital platforms feed breast-milk substitutes promotions directly to the screens of pregnant women and mothers, respond instantaneously to the concerns they express, use respected influencers to shape feeding decisions, generate word-of-mouth endorsements for breast-milk substitutes products and establish online support groups to build positive associations with breast-milk substitutes brands. These low-cost and effective methods are known to increase purchasing behaviour as measured by sales.

Regulation of digital marketing

Use of the digital marketing techniques described in this report presents novel challenges for regulating promotion of breast-milk substitutes. Fewer than one in five countries (19%) explicitly prohibits promotion of breast-milk substitutes on the internet, social media, or other digital platforms. Digital technologies enable advertisers to evade scrutiny from enforcement agencies by delivering breast-milk substitutes promotions to personal accounts without ever publishing them on broadcast media. It may be difficult to hold breast-milk substitutes manufacturers and distributors to account for breast-milk substitutes promotions generated in virtual support groups by the general public and mothers, including social media influencers, who are not direct employees or contractors of those companies.

Strengthened legislation, new monitoring technologies, renewed commitment to enforcement and transnational frameworks are urgently required to protect breastfeeding and safeguard the health of mothers and babies

Key findings

- 1 **Digital marketing is becoming the dominant form of marketing in many countries. In some countries more than 80% of exposure to breast-milk substitutes advertisements occurs online.**
- 2 **Digital marketing increases breast-milk substitutes sales and occurs across multiple online channels and social media platforms in every country.**
- 3 **Breast-milk substitutes companies buy direct access to pregnant women and mothers in their most vulnerable moments from social media platforms and influencers. They use apps, baby-clubs, advice services and online registrations to collect personal information and send personalized breast-milk substitutes promotions to mothers.**
- 4 **Breast-milk substitutes companies use strategies that aren’t recognizable as advertising, such as online baby-clubs, advisory services, social media influencers, and user-generated content.**
- 5 **Breast-milk substitutes brand accounts post content on social media around 90 times per day and these reach three times as many people as informational posts about breastfeeding.**
- 6 **Digital marketing can evade scrutiny from enforcement agencies. New approaches to code-implementing regulation and enforcement are required.**

Digital platforms feed breast-milk substitutes promotions directly to the screens of pregnant women and mothers.

¹ Resolution WHA 73(26).

² Digital marketing is promotional activity, delivered through a digital medium, that seeks to maximize impact through creative and/or analytical methods. Digital media may include social media platforms, video sharing applications (apps), search engines, company websites, messaging services and online retailers.



Introduction

Despite ample evidence that exclusive and continued breastfeeding are key determinants of lifelong health for children, women and communities (23), far too few children are breastfed as recommended.³ Globally, only 44% of children under 6 months of age are exclusively breastfed and 56% of children stop breastfeeding before they reach the age of 2 years (24). A global target to increase the rate of exclusive breastfeeding amongst infants under 6 months up to at least 50% by 2025 was agreed by Member States at the World Health Assembly (WHA) in 2012. Recent estimates suggest that failing to reach that target would result in an estimated 520 000 child deaths, as well as increased disease and cognitive deficits in children. Total economic losses attributable to “not breastfeeding” globally have been estimated to be 0.7% of gross national income or US\$ 341.3 billion (25). Yet, it is estimated that an investment of only US\$ 5.7 billion would be required to meet the global target (25, 26). Significant actions will be required to achieve this global target (27).

Member States agreed to eliminate the inappropriate promotion of breast-milk substitute (BMS) more than 40 years ago (28). Recognizing the impact of BMS promotion on breastfeeding practices, and the health risks introduced by inappropriate feeding in early life, the WHA adopted the *International code of marketing of breast-milk substitutes* in 1981 (5). Eighteen subsequent WHA resolutions and decisions have addressed this issue since 1981, and taken together the Code and the subsequent resolutions (hereafter referred to collectively as “the Code”) express the collective will of assembled Member States.

Article 5 of the Code provides that there should be no advertising or other form of promotion of BMS to the general public. Yet the inappropriate promotion of BMS continues unabated in much of the world and the advent of digital technologies has created powerful new marketing tools for the promotion of BMS. While Article 5 is clearly broad enough to capture digital BMS promotions, the Code does not specifically address the digital marketing strategies that have evolved in the four decades since its adoption and does not offer strategies for implementation in digital environments or ecosystems.

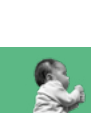
Digital technologies are increasingly used for marketing of food products throughout the world. Growth in BMS product sales has eclipsed growth in the global birth rate (29). The global formula market has been valued at more than US\$ 52 billion (30). The use of digital platforms by BMS manufacturers and distributors to promote their products is accelerating (29, 31).

In November 2020, the Seventy-third World Health Assembly requested in resolution WHA73.26 that the Director-General review current evidence and prepare a comprehensive report to understand the scope and impact of digital marketing strategies for the promotion of BMS to the Seventy-fifth World Health Assembly in 2022.

This report was developed in response to WHA resolution 73.26 and describes a comprehensive review of evidence that describes the scope and impact of digital marketing strategies used for the promotion of BMS. Chapter 1 describes digital marketing and digital marketing strategies in use at the time of writing. Chapter 2 describes the methods used to assemble evidence that describes what is known about digital marketing strategies used for the promotion of BMS and their impacts. Chapter 3 describes the extent of digital marketing for the promotion of BMS. Chapter 4 describes digital marketing techniques and their use for the marketing of BMS. Chapter 5 examines the extent to which provisions of the Code and national implementation instruments capture digital marketing strategies for the promotion of BMS. Chapter 6 discusses monitoring and enforcement of digital marketing strategies used for the promotion of BMS, and Chapter 7 presents some implications of the evidence described in this report for implementation, monitoring and enforcement of the Code in digital ecosystems.

Despite ample evidence that exclusive and continued breastfeeding are key determinants of lifelong health for children, women and communities (11), far too few children are breastfed as recommended.

³ WHO recommends that infants are exclusively breastfed during the first six months of life and then breastfed continuously until two years of age and beyond. From 6 months of age, breastmilk should be complemented with a variety of adequate, safe and nutrient-dense foods.



1. Digital marketing

Digital marketing is “promotional activity, delivered through a digital medium, that seeks to maximize impact through creative and/or analytical methods” (1). Digital marketing strategies for the promotion of BMS include industry-sponsored online social groups, individually targeted advertisements, paid blogs or vlogs, and discounted Internet sales. Digital media may include social media platforms, video sharing applications (apps), search engines, company websites, messaging services and online retailers.

Mobile service connectivity is now available to 97% of the world’s population. Globally, more than 3.6 billion people use social media (approximately 87% of internet users), and this is projected to increase to 4.41 billion by 2025 (32).

Digital platforms have become the marketing industry’s most important tools. In 2019, more than 50% of total media advertising budget was spent on digital marketing and the proportion is predicted to increase to 67.8% by 2024, by which time the digital marketing industry is expected to be worth US\$ 645.8 billion (32).

Digital marketing strategies

Digital media have created new, cost-effective and powerful tools for distributing promotions for BMS and have generated opportunities to develop marketing techniques not possible in traditional media (such as print, broadcast and outdoor advertising) and retail environments. Digital platforms enable advertisers to disseminate traditional advertisements simultaneously across multiple media, such as video sharing, social media, websites, emails and encrypted messaging apps. This enables advertisers to increase the frequency with which a consumer is exposed to its marketing messages.

These exposures, also known as touchpoints, are known to play a critical role in shaping potential customers’ attitudes and purchasing behaviours (33). The frequency, timing and type of touchpoints a consumer experiences are critical to successful marketing. In addition to increasing the number of opportunities to reach consumers with their advertising content (touchpoints), digital media platforms have created a number of new marketing tools and strategies.

Organic posts are recognizable as advertisements published on the timelines of advertisers’ profile pages. These promotional posts then appear on the timelines (or newsfeeds) of all users who follow advertisers’ social media accounts. When these followers like, comment on or share an advertiser’s post it appears on their friends’ newsfeeds.⁴

Boosted posts are advertisements that are digitally modified (optimised) to reach users with characteristics selected by the advertiser. Once an advertiser selects the audience it wants to boost an advertisement to, an algorithm automatically selects image and text elements that increase engagement (clicks, likes or shares) (9). According to Facebook for Business, “Boosting a post may help you get more people to react, share and comment on it” (34). Encouraging new audiences to like or follow an advertiser’s social media account makes them easier to reach with future promotions.

Dark posts are also known as dark ads or unpublished posts. Like boosted posts, these are tailored to appeal to consumers with specific characteristics or profiles. They appear in the daily newsfeeds of specific users, regardless of whether they follow the advertiser’s social media account. Importantly, dark posts do not appear on an advertiser’s own timeline. Dark posts are not visible to other users and can be used to evaluate the performance of advertisements and other promotional posts. They are used to minimise the volume of recognizable advertising and promotion that appears on the advertiser’s own social media account and create an impression that an advertiser truly understands (and can therefore meet) the targeted user’s individual needs.

Digital video, audio and podcasts do not usually appear to be advertising or promotion. They may include advertising, product placement promotions, product reviews or endorsements. However, they may also offer content that engages specific audiences, such as professional development or information about parenting topics, in order to create positive sentiments about a brand or product line while evading consumers’ critical responses to advertising and promotional content.

Advertisers can have targeted advertisements placed amongst search engine results (this is also known as search engine

marketing). Paid search advertisements appear in response to pre-defined search engine queries. Advertisers pay a fee each time a user opens the link in their advertisements.

Televisions that are connected to the web — often referred to as smart or connected TVs — offer customised services such as replaying content and streaming video content while capturing data about users and their online behaviour. Apps available on connected TVs can themselves contain digital marketing content, including advertisement and they are often linked to users’ other devices, thus increasing the quantity and quality of user data captured. In the near future, it is likely that advertisers will be able to display advertisements on connected televisions targeted specifically to the individual viewing the device.

Digital Out-of-Home (OOH) or digital billboards enable advertisers to display promotional content, usually advertisements, to digital screens erected in public places. As with connected TVs, in the near future digital billboards may be able to display an advertisement or promotion customized for the person passing by communicating with that individual’s smartphone.

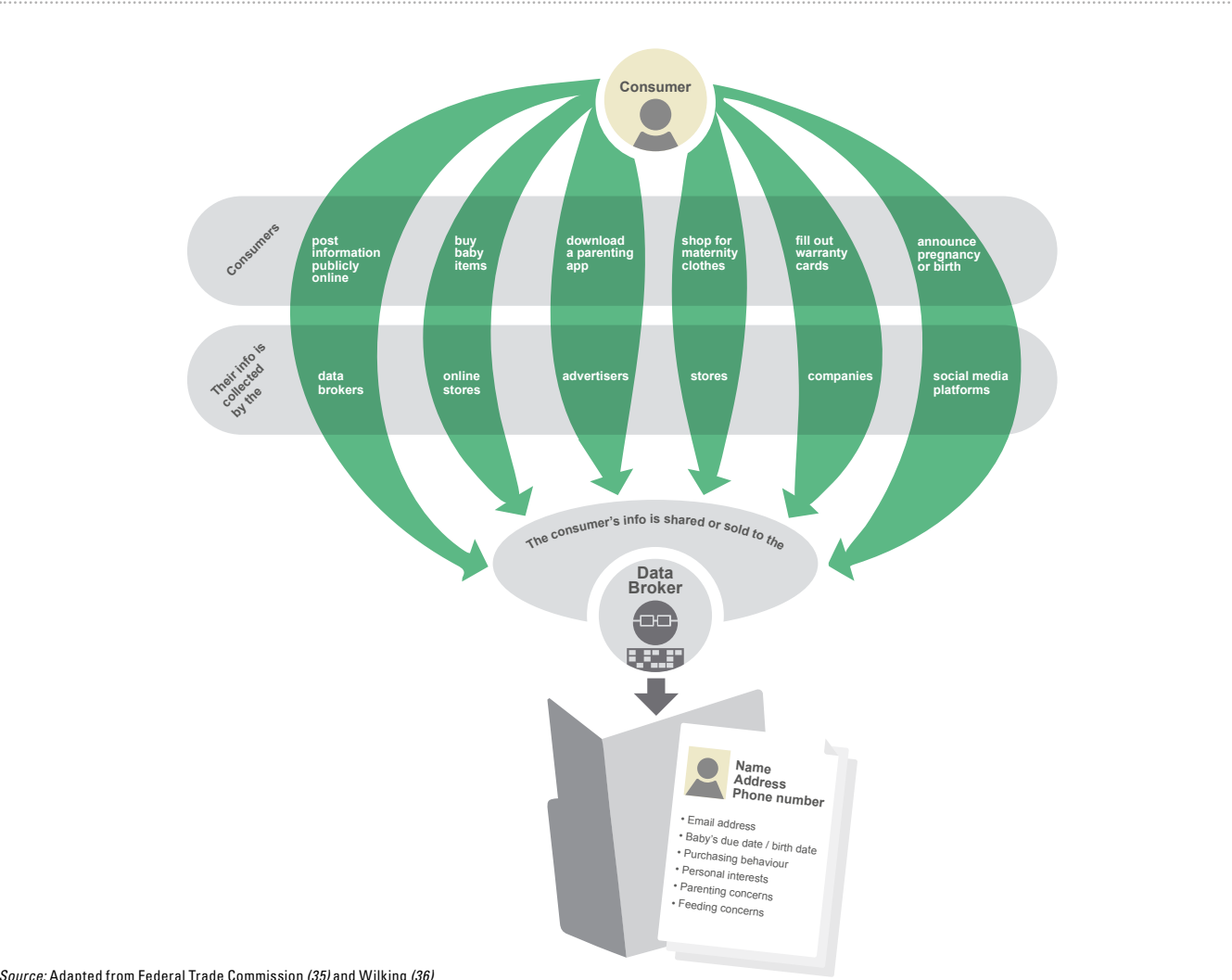
Digital marketing tools enable advertisers to identify key consumers and increase these consumers’ exposure to marketing content that promotes their products and maintains positive

brand sentiment. Increasing consumers’ exposure to marketing content (creating multiple brand touchpoints) is known to increase sales. BMS manufacturers use these digital marketing tools and strategies to maximize consumers’ exposure to marketing content (brand touchpoints) and increase purchases of BMS products.

Digital platforms make it possible for advertisers to identify their target audiences with unprecedented precision. When women share information about a pregnancy with family and friends online, purchase maternity clothing, search for a health care provider or join an online support group they are identified as targets for advertising for baby-related products and brands, including BMS. These data can be collected across multiple online platforms and combined with information collected in offline environments, such as credit-card transactions, mailing lists or information on personal or professional memberships (see Fig. 1).

These digital marketing strategies have emerged and evolved in recent decades since the Code was adopted and are now being applied to the promotion of BMS products. The remainder of this report seeks to provide a comprehensive description of the global scope and impact of digital marketing strategies for promoting BMS.

Fig. 1. Types of information data brokers collect online and offline



Source: Adapted from Federal Trade Commission (35) and Wilking (36)

⁴ 'friends' here means other users of a social media platform identified as 'friends' for the purpose of creating a network within a social media platform database that is used to disseminate content, including marketing communications.

2. Methods

To develop this report WHO created an external steering committee of experts from across WHO regions to advise on the design and methodology of the review and the report. Subject matter experts were selected for their expertise in social science, epidemiology, marketing, global health, nutrition, psychology and consumer behaviour, human rights law, Code monitoring and implementation policy (see Annex 1). Following an initial consultation meeting, at which the committee advised on the broad content of the report and identified potential sources of data, the committee met monthly for six months to

advise on structure and review draft content. Subject matter experts assembled for this task were drawn from all WHO regions, with the exception of the Eastern Mediterranean Region.

The report is based on several sources of evidence, including:

- a systematic literature review
- social listening research on public online communications
- a multi-country study (MCS) of mothers⁵ and health professionals’ experiences of BMS marketing

Table 1. Summary of studies included in the systematic review

Study type	Publications (n)
Peer-reviewed paper	22
Independent report	7
Case reports	23
Region	Publications (n)
Americas	11
Africa	1
Eastern Mediterranean	0
Europe	3
Southeast Asia	5
Western Pacific	23
Multiple	6
Digital marketing platform	Publications (n)
Social media	27
Blogs/vlogs	12
Mobile applications	9
Websites (manufacturer, online magazines, or general)	21
Online retail	4
Video/music channel	3
Other	6

- individual country reports of research that monitors BMS promotions and
- an analysis of existing legal measures on the Code.

The results of these works are presented contiguously and organized thematically.

Systematic review

A systematic review of the evidence was commissioned from the George Institute for Global Health to describe what is known about the scope and impact of digital marketing strategies for promotion of BMS on what people think, what people intend to do and what people actually do.

The full study protocol — including search terms, eligibility criteria, screening diagram and summary of included publications — are available from the Open Science Framework Registry. The study protocol was registered prior to commencement.

The systematic review identified 22 peer-reviewed papers, 7 independently-published reports and 23 case reports that described evidence of the scope and/or impact of digital marketing campaigns for the promotions of BMS products or brands. Table 1 summarizes the results of the systematic review. A full list of included publications (academic literature and case reports) are included in Annex 2. Only three studies examined impact of digital marketing. The remaining studies examined scope. Annex 2 describes included publications. The full report is available from the George Institute for Global Health. (37)

Specific objectives were to:

- 1
- audit digital marketing strategies used to influence or support infant feeding practices;
- 2
- assess exposure of pregnant women and young mothers to BMS promotion;
- 3
- examine digital marketing content, including earned impressions, advertising campaigns and communications from peers or social media influencers; and
- 4
- capture branded and unbranded content that offers insights into women’s digital exposure to BMS marketing and other infant feeding practices.

Social listening research

Research was commissioned using a commercial social media intelligence platform (SMIP) (21). SMIPs monitor social media for mentions of defined key words or phrases, which they gather, organize and analyse. They “listen” to the billions of

daily exchanges and conversations that take place amongst social media users around the world and on other digital platforms, such as websites and forums. SMIPs are commonly used by advertisers to understand drivers of consumer behaviour, find inspiration for future marketing strategies and identify characteristics of consumers most vulnerable to these strategies. This research reversed the usual application of a SMIP to generate insights into and understanding of digital marketing strategies used for the promotion of BMS.

Data were collected globally from Facebook, Instagram, Pinterest, Twitter, Sina Weibo⁶, Red (also known as Xiaohongshu, 小红书),⁷ VKontakte,⁸ YouTube, WeChat (also known as Weixin),⁹ blogs, websites, digital press, discussion boards and retail platforms visible to search engines between 1 January and 30 June 2021. This investigation captured digital interactions that referenced infant feeding in 11 languages that originated from 17 countries, which together account for 61% of the global population and span all six WHO regions. The results of this study appear mainly in Chapters 3 and 4.

Multi-country study

Exposure to BMS marketing amongst pregnant women and mothers across eight countries was assessed using phone diaries (n=141), focus group discussions (n=91 groups), in-depth interviews (n=70) and a questionnaire (n=8528). Attitudes and perceptions of people who influence women’s infant feeding decisions were investigated using in-depth interviews with health professionals (n=302) and focus group discussions with partners, family and friends (n=22). In China, an additional 10 in-depth interviews with marketing executives and two focus group discussions with full-time childminders (known as Yuesaos in Mandarin) hired for the first months after birth were conducted. Fig. 2 illustrates the study approach.

The questionnaire was piloted for face-validity in Viet Nam and questions subsequently refined prior to translation and adaption for use in the other seven countries. Table 2 describes the characteristics of the sample. Detailed description of data collection and analysis can be found in the study report (39). Experiences with digital marketing were extracted and included in this report. The results of the study inform Chapters 3 and 4.

Legal analysis

National legal measures that give effect to the Code were analysed as part of WHO’s review of national Code implementation to be published in 2022. This routine policy review was last conducted by WHO in 2020 (40). Relevant legal documents were obtained through ministries of health with the assistance of WHO regional and country offices. Documentation was

⁵ WHO recognizes the important role of all parents and other caregivers in infant and young child feeding. However, evidence reviewed in this report describes the extent and impact of exposure to BMS promotions specifically amongst pregnant women and mothers because these are the populations targeted by BMS promotions.

⁶ Chinese equivalent of Twitter. As of the third quarter of 2021, Sina Weibo’s monthly active users amounted to around 573 million and it is the leading micro-blogging site in China <https://www.statista.com/statistics/795303/china-mau-of-sina-weibo/>

⁷ China’s foremost fashion and luxury shopping platform. Users post product photos with reviews and tips for others to read, comment and save to their boards, more like Pinterest than Amazon. <https://www.linkfluence.com/blog/little-red-book-xiaohongshu>

⁸ VK is the largest social media networking site in Russia. In the global ranking of social networks it is ranked second after Facebook and ranks fifth on the list of all websites available. <https://www.echosec.net/blog/what-is-vk-and-why-should-you-care>

⁹ WeChat is a “one-stop shop” for social and transactional moments in China; a multi-purpose social media, messaging and payment platform with 1.24 billion monthly active users. <https://blog.hootsuite.com/wechat-marketing/>

Table 2. Characteristics of the multi-country study sample

	Bangladesh	China	Mexico	Morocco	Nigeria	South Africa	United Kingdom	Viet Nam
Age								
Average age	25	31	27	30	31	NA	33	NA
Range	18–50 (32)	20–44 (24)	18–50 (32)	18–50 (32)	18–46 (28)	NA	18–47 (29)	NA
Age (grouped)								
18–24	52% (616)	7% (68)	38% (397)	17% (174)	13% (136)	28% (295)	8% (81)	13% (138)
25–29	30% (352)	35% (361)	27% (280)	30% (314)	34% (352)	28% (295)	20% (206)	37% (387)
30–34	13% (155)	42% (436)	19% (201)	31% (321)	31% (321)	22% (234)	39% (407)	30% (317)
35–39	4% (52)	15% (155)	13% (139)	13% (132)	18% (192)	17% (173)	27% (282)	15% (160)
40–44	0% (1)	3% (30)	3% (29)	9% (99)	4% (42)	5% (52)	7% (70)	4% (40)
45–50	0% (2)	0% (0)	0% (4)	1% (10)	15 (7)	0% (1)	1% (6)	1% (8)
Socio-economic status								
Low	33% (393)	33% (350)	33% (350)	33% (350)	33% (350)	33% (349)	31% (330)	33% (351)
Medium	33% (393)	33% (350)	33% (350)	33% (350)	33% (349)	33% (351)	34% (359)	33% (354)
High	33% (392)	33% (350)	33% (350)	33% (350)	33% (351)	33% (350)	35% (363)	33% (345)
Parental status								
Pregnant	24% (283)	29% (300)	29% (302)	29% (300)	29% (300)	29% (300)	29% (300)	29% (301)
Postnatal	76% (895)	71% (750)	71% (748)	71% (750)	71% (750)	71% (750)	71% (752)	71% (749)
Parity (other living children)								
Yes	44% (437)	35% (370)	50% (526)	53% (558)	57% (594)	56% (426)	49% (510)	58% (608)
No	56% (552)	65% (680)	50% (524)	47% (492)	43% (456)	44% (339)	51% (542)	42% (442)
Education								
No education	3% (36)	0% (0)	2% (19)	0% (0)	29% (301)	0% (0)	0% (1)	0% (0)
Primary education	46% (543)	0% (0)	10% (102)	24% (246)	0% (0)	4% (44)	0% (2)	1% (14)
Secondary education	36% (427)	46% (478)	79% (834)	49% (517)	4% (42)	70% (725)	27% (266)	36% (475)
Higher education	11% (131)	48% (499)	9% (95)	26% (272)	44% (460)	26% (266)	53% (549)	53% (552)
Postgraduate	4% (41)	7% (73)	0% (0)	1% (14)	24% (247)	0% (0)	20% (213)	0% (0)
Fridge								
Yes	NA	NA	NA	NA	87% (915)	99% (1040)	NA	99% (1038)
No	NA	NA	NA	NA	13% (135)	1% (10)	NA	1% (11)
Improved water source in home								
Yes	NA	NA	NA	NA	60% (629)	99% (1036)	NA	NA
No	NA	NA	NA	NA	40% (419)	1% (14)	NA	NA
Number of people in household								
Average number	5	4	5	5	4	5	NA	4
Range	2–16	2–9	1–18	1–12	2–17	1–16	NA	1–18
Currently working								
Yes	9% (104)	57% (599)	29% (303)	10% (101)	73% (768)	53% (560)	39% (410)	48% (499)
No	91% (1074)	43% (451)	71% (747)	90% (949)	27% (282)	47% (490)	61% (642)	52% (551)
Receiving maternity support								
Yes	NA	67% (556)	5% (57)	NA	NA	56% (369)	67% (624)	63% (458)
No	NA	33% (273)	95% (993)	NA	NA	44% (306)	33% (306)	37% (274)

NA: not available; SES: socio-economic status
Source: WHO. Multi-country study report (39).

Figure. 2. Multi-country study approach



Note: Yuesaos are full-time childminders.
Source: WHO. Multi-country study report (39).

also obtained from legal databases (Lexis/Nexis and FAOLEX), national gazettes and internet search engines. These were analysed to determine whether countries’ legal provisions apply to digital marketing strategies used for the promotion of BMS. Legal measures were coded as capturing (implicitly or explicitly) or excluding digital BMS marketing strategies. Results of this analysis are reported in Chapter 5.

Country reports

Reports of research describing exposure to, or observations of, BMS marketing were identified in country-specific monitoring reports of violations of the Code. These reports describe data collected using various cross-sectional, descriptive designs.

These include surveys that applied NetCode¹⁰ or similar protocols or targeted media-monitoring conducted since 2016. The NetCode protocol includes a module for monitoring BMS marketing that occurs in digital media. It uses interviews with mothers to collect data on exposure to (recall of) digital BMS marketing, to identify local BMS products, brands and online retailers and to identify internet channels via which BMS promotions are disseminated.

Only analyses of digital BMS marketing are included in this report. These are listed in Annex 3. Results of these reports largely inform Chapter 6.

¹⁰ NetCode is the Network for Global Monitoring and Support for Implementation of the International Code of Marketing of Breast-milk Substitutes and Subsequent relevant World Health Assembly Resolutions. The NetCode toolkit for monitoring and periodic assessment of the Code is comprised of a Protocol for ongoing monitoring systems and a Protocol for periodic assessment. For more information see: <https://apps.who.int/nutrition/netcode/toolkit/en/index.html>

3. Extent of digital BMS marketing

There is clear evidence that digital marketing is routinely used for the promotion of BMS. Peer-reviewed studies indicate that this marketing has a negative impact on breastfeeding intention and initiation. Case reports published in the industry press describe benefits of digital marketing for increasing intention to use BMS products, recruiting new users and, ultimately, increasing product sales.

Exposure

Exposure to online BMS promotions is common amongst mothers of infants and young children and this exposure affects breastfeeding outcomes (41, 42). Social listening research, the multi-country study and the systematic review found evidence that strategic and integrated use of digital marketing strategies for the promotion of BMS occurs across a wide range of online channels and social media platforms.

Digital marketing of BMS is pervasive. Women are exposed to digital marketing techniques in every country where research investigating this issue has been conducted. Women who participated in surveys and interviews for the multi-country study consistently reported seeing advertisements and promotions when seeking information, advice or support about infant feeding advice online across all eight countries. Women in all eight countries reported seeing BMS marketing online and in social media. Online BMS marketing may be concentrated in countries or regions in which potential to increase BMS uptake (market growth) is strong; that is, principally in countries where large populations are experiencing increased spending power. A recent investigation of digital marketing for BMS in the South East Asia Region found that BMS marketing was more prevalent in Indonesia than in Thailand or Bangladesh (World Health Organization Regional Office for the South East Asian Region,

unpublished data, 2021). This result is consistent with the results of survey research conducted in Badung, Indonesia, which found that around 60% of women surveyed reported seeing BMS advertising on Facebook (43). Similarly, more than 80% of women surveyed for the multi-country study who reported seeing BMS advertisements in Mexico and Indonesia reported seeing them online. Forty percent of mothers surveyed in China and 32% of mothers surveyed in Viet Nam reported seeing BMS marketing on social media. An earlier study conducted using the NetCode protocol found that 45.5% of women surveyed in Viet Nam in 2016 recalled seeing a BMS promotion on the internet and 25.3% recalled seeing a BMS promotion on social media (44).

Digital marketing is quickly becoming the dominant form of BMS marketing in many countries. Reports included in the systematic review found that the most frequently identified sources of advertising for BMS products in Indonesia (45) and Viet Nam (44) were the internet and Facebook. In Thailand in 2018, Facebook was the most commonly reported source of BMS marketing observed during media monitoring and most of these advertisements (58%) originated from company/brand websites, followed by companies’ Facebook accounts (46). In the Philippines, social media and the internet were the second and third most common source of exposure to BMS promotions after television in 2021 (47).

The distribution by media channel of BMS promotions recorded in marketing diaries by women in each country is described in Table 3 . Digital media platforms were amongst the top three sources of exposure to BMS promotion reported by women who participated in the multi-country study in every country except South Africa.

Table 3. Top three channels where BMS marketing is seen across countries amongst women who reported exposure to BMS marketing in the multi-country study

Bangladesh (N=321)	China (N=1014)	Mexico (N=413)	Morocco (N=27)	Nigeria (N=254)	South Africa (N=222)	United Kingdom (N=888)	Viet Nam (N=970)
 Cable TV 66%	 TV 72%	 TV 84%	 Social media 78%	 TV 83%	 TV 78%	 TV 68%	 TV 86%
 YouTube 31%	 Supermarket 58%	 YouTube 12%	 TV 22%	 Hospital/clinic 10%	 Supermarket 17%	 Social media 18%	 YouTube 35%
 TV 25%	 Bilibili/ TikTok 41%	 Social media 9%	 Supermarket 4%	 Social media 9%	 Magazine 9%	 YouTube 6%	 Social media 35%

Note: Bilibili, nicknamed The Website B, is a Chinese video sharing website.
Source: WHO. Multi-country study report (39).

Women in each of seven countries who recorded exposure to BMS promotions in marketing diaries over a single week for the multi-country study reported seeing advertisements for formula on social media and e-commerce sites. These included promotion of infant formula, follow-on formula and toddler formula in the form of product or brand advertisements, promotions for virtual support groups known as baby clubs hosted by BMS brands, BMS branded apps and social media influencers promoting BMS products.

The total number of BMS promotions recorded in these marketing diaries by women in each country is described in Table 4 and the average number of promotions recorded in marketing diaries by women in each country is also illustrated in Fig. 3. On average, these women reported seeing online BMS promotions at least once a week and often more frequently.

In South Africa, for example, women reported seeing such promotions as often as once a day.

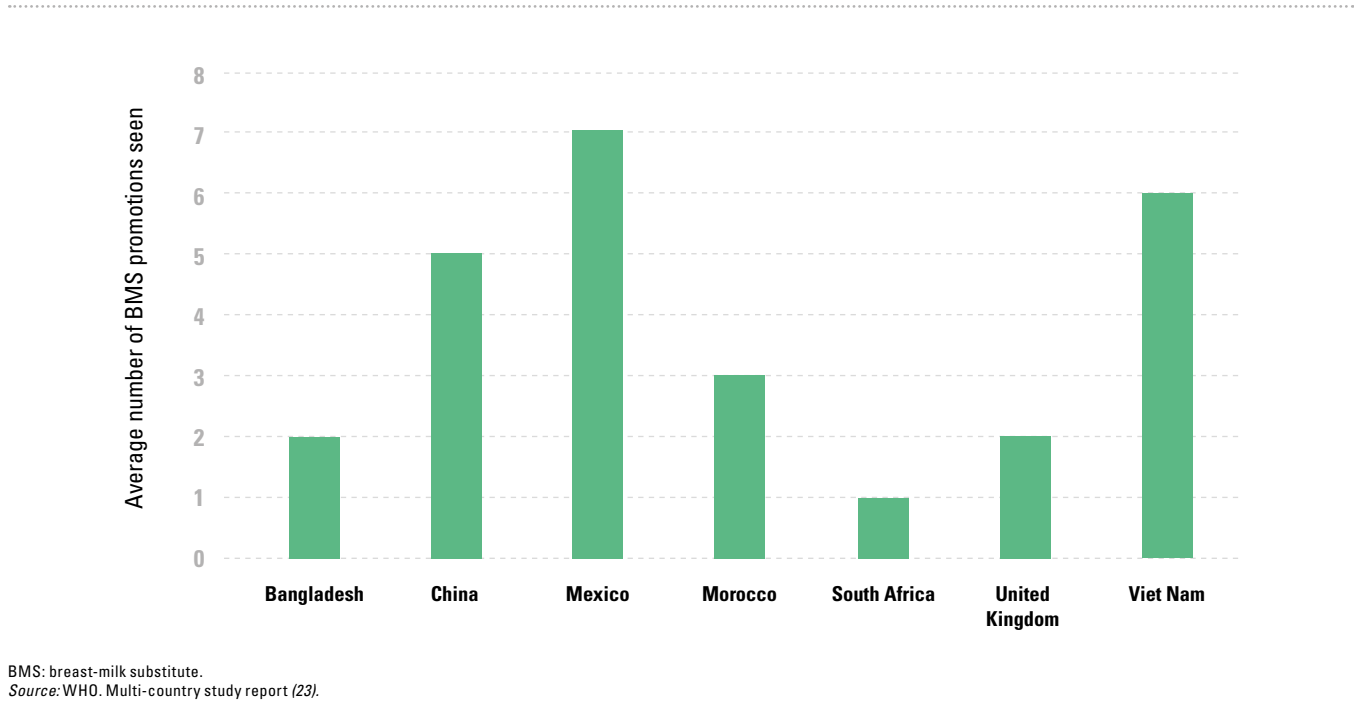
The multi-country study found that pregnant women and mothers were exposed to both traditional advertising content and targeted content (that is, content made visible only to individual users in response to the data collected about them). These promotions are crafted to address the individual values and concerns of the targeted user and they may not be easily recognizable as advertising. They include dark posts, boosted posts and direct communications through clubs, advice services, emails, apps or encrypted messaging services. The authors of the multi-country study note that digital marketing may be difficult to distinguish from independent health or parenting information, such as that provided by health departments, nongovernmental organisations, health professionals or civil

Table 4. Number of formula milk advertisements recorded in phone diaries across one week collected by 20 women per country for the multi-country study

	Bangladesh	China	Mexico	Morocco	Nigeria	South Africa	United Kingdom	Viet Nam
No. of phone diary entries	37	109	138	55	NA	19	41	126
Average no. of diary entries* per woman	2	5	7	3	NA	1	2	6

*Numbers are rounded up to the nearest one
Source: WHO. Multi-country study report (39).

Fig. 3. Number of online BMS promotions recorded in phone diaries kept by women for one week for the multi-country study



society organisations (39). Therefore, it is likely that women are exposed to much more digital marketing for the promotion of BMS than they are aware of and that the true magnitude of exposure is even higher than suggested by research that relies on self-reported data.

Research investigating country-level compliance with the Code consistently finds instances of digital marketing for the promotion of BMS. Research that monitored BMS promotions published on social media accounts owned by BMS brands (e.g., Facebook pages, Twitter accounts, YouTube channels, Instagram accounts), BMS company websites, online magazines, parent blogs/vlogs, news media and online retailers in Bangladesh, Indonesia and Thailand for four months in 2020 identified 2 440 advertisements for BMS (World Health Organization Regional Office for the South East Asian Region, unpublished data, 2021). The vast majority of these (1 697) originated from Indonesia where 742 tweets promoting BMS reached over 1.5 million users. On average, each of these BMS brand accounts posted 46 times a month and each of these posts reached an average of 40 000 users globally. Almost 25% of the remaining original content directly promoting BMS products originated from a retailer’s account (World Health Organization Regional Office for the South East Asian Region, unpublished data, 2021). Media monitoring conducted in India in 2019/20 observed an increasing trend in digital marketing activities for the promotion of BMS across a four-month period. Retail websites were the most frequent source of BMS promotions, followed by Twitter and Youtube (WHO India, unpublished data, 2021). Reports published in several countries across South America report similar findings (see Annex 3).

Social listening research commissioned for this report analysed interactions that occurred in online marketing communities where infant feeding or infant feeding products were discussed in order to understand who is talking about infant feeding, what they are saying, the reach of those messages (how many

users see these posts and which users see them) and impact or engagement (number of users who like, comment, share, click, purchase or interact with marketing content in some way) (38).

Between January and June 2021, just over 4 million posts about infant feeding were sampled and analysed. These data were collected from public and commercial accounts without regard for source, location or language. They did not include content published on private users’ timelines or dark posts. Of these, 73% specifically referenced breastfeeding and 17% referenced formula milk feeding. While fewer than 10% were clearly identifiable as advertisements, more than 20% of these posts ($n=419\,000$) contained references to a BMS brand or product (38).

Almost one in five (19.3%) posts originated from an account owned by a BMS manufacturer. Around 42% of posts that referenced a BMS brand or product originated from a retail review website or an online consumer forum. Almost half of the posts containing a reference to a BMS brand (46%, $n=195\,000$) appeared on a social media platform (Facebook, Twitter, Red, Instagram, Pinterest, VKontakte or Sina Weibo). These posts reached 2.47 billion people and generated more than 12 million engagement actions (i.e., like, share or comment) (38).

Digital marketing strategies are used for the promotion of BMS in spite of national regulations enacted to implement the Code. Sri Lanka was one of the first countries to enact Code-implementing legislation shortly after the World Health Assembly called upon Member States to do so in 1981. However, in 2018, research found that mothers who spent time on the internet, including on social media platforms, were exposed to BMS promotions. Amongst mothers surveyed, 12.5% reported participation in an online baby-club or parenting group and 11% of this group reported awareness that the group they had participated in was hosted by a BMS brand (Health Systems Research Unit, University of Colombo, unpublished data, 2018).

Digital marketing for the promotion of BMS is highly effective. The 264 BMS brand accounts monitored for the social listening research collectively posted content 15 600 times during the monitoring period (or around 90 times per day). Together, these posts reached 229 million users and prompted 2.68 million engagement actions. On average, each individual BMS account posted content 10 times each month, representing significant investment in content development and personnel. Each of these posts reached around 14 000 people and provoked more than 150 engagement actions. This engagement rate of 1.1% is up to 10 times greater than the rate generally considered to indicate an effective campaign (38).

Impact

Social listening research found that social media posts that included a reference to a BMS brand or product reach three times as many people as posts about breastfeeding. Furthermore, when people are exposed to this content, they are more likely to engage with it by liking it, sharing it, or clicking on a link in it (including to make a purchase) than they are to interact with informational content (38). Thus, while there is a huge volume of posts mentioning breastfeeding, branded posts are seen by more people and more people will take some action in response to them.

Case reports from professional marketing literature included in the systematic review also describe the impact of BMS marketing. These case reports routinely describe BMS marketing campaigns reaching tens of millions of social media users during very short periods. They also describe impact on purchasing behaviour measured by increased sales. These reports provide clear evidence that digital marketing for BMS promotion affects purchasing behaviour (37).

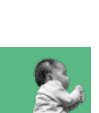
Digital marketing generates better value for companies than traditional marketing techniques. Budgets were reported by 15/22 case reports included in the systematic review. The expenditure on digital campaigns reported in the industry press ranged from US\$ 3 500 spent launching audio stories on a music streaming platform in Mexico (48) up to US\$ 10 million spent on digital behaviour monitoring, tracking and social listening across desktop and mobile device platforms in China (49). One campaign conducted in Viet Nam is reported to have reduced the cost of attracting each new user (follower) by 20% compared to the previous year by posting ads via Facebook, Instagram, Zalo, Bing and Google (50). In Indonesia, contacting new marketing contacts (parents) using an automated tool on WhatsApp was reported to be more effective and 50% cheaper than previous campaigns using telephone (51).

Several case reports described digital marketing campaigns that attracted new users and increased sales. One campaign in China using online, social media, editorial, in-store and events reportedly grew new users by 246% in one year (52). Another campaign that used a messaging app to map and reach users generated \$25 000 from new users (53).

In China, a campaign driven by artificial intelligence (AI) technology drove more than US\$2.2 million in sales (54) and another increased sales by 32% (55). Another campaign which provided educational content for children increased sales of BMS product by 30% (56). In Indonesia, another campaign that used meta-data to geo-target and provide users with directions to nearby shops using Google Maps increased sales by 18% (57).

There is significant evidence that digital marketing for the promotion of BMS is highly prevalent on social media and in other online environments. The reach of digital BMS marketing is so great that, in many countries, it is inescapable. Advertisers report large increases in purchases of formula milk as a direct result of these promotions, demonstrating that digital marketing of BMS significantly influences infant feeding decisions and practices. The research on the massive extent of digital marketing and its impact on purchasing decisions demonstrates an environment where mothers are persistently exposed to strategic and integrated BMS marketing. It is therefore not surprising that digital marketing is rapidly becoming the dominant form of BMS promotion.

While there is a huge volume of posts mentioning breastfeeding, BMS branded posts are seen by more people and more people will take some action in response to them.



4. Digital marketing techniques to promote BMS

Strategies used by manufacturers to market BMS products and brands in a digital context include well-known tactics used in traditional media. Televised video advertisements can be presented on an internet site; magazine print advertisements can appear in online articles; retail price reductions can be offered by online retailers. Traditional marketing strategies continue to be used, including posting imagery and/or wording that idealizes use of BMS and offering point of sale promotions such as coupons, samples and discount codes for use at online retailers. However, the digital context also offers new opportunities for marketers that present novel challenges for regulating inappropriate promotion of BMS. These include widespread mining of internet user data to facilitate highly-targeted cross-device marketing to specific types of consumers, new avenues such as apps to directly contact parents in real time and establishing financial relationships with parents to reward them for promoting products to their peers on blogs and social media.

Targeting

The machine-learning algorithms that power social media advertising collect, aggregate and analyse data generated by users. These data reach well beyond general demographic and geographic information and include users' interests, the content they engage with, their connections with other users and, ultimately, the drivers of their purchasing behaviour. Users generate these data both actively — by filling in forms, posting and sharing content — and passively, as they interact with content on social media, in apps and in other online environments. It is virtually impossible for users to avoid leaving what is known as a data footprint that can be used to target them with advertising on social media and other online platforms (36, 58).

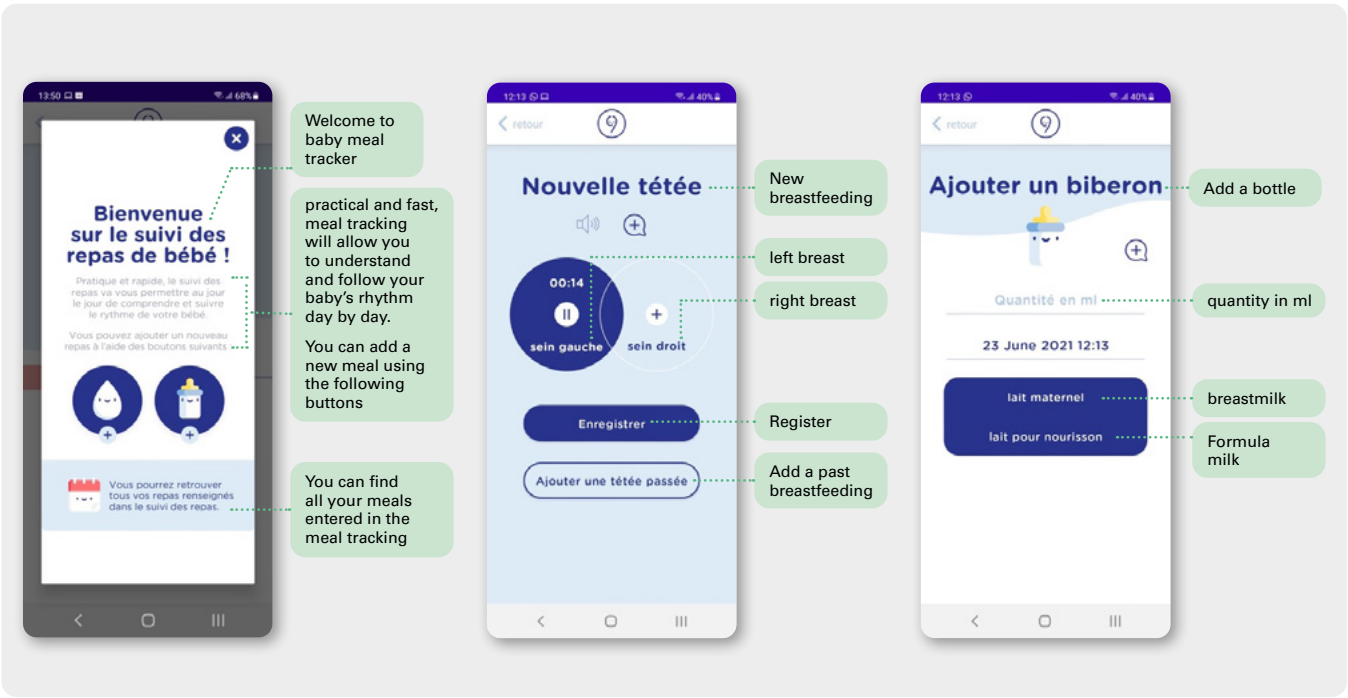
These data footprints can also be used to identify and target others in a process known as lookalike targeting. Lookalike targeting enables advertisers to extend the audience the reach of their promotions by identifying new people who are similar to those already targeted (59). As a result, it may be difficult for women to avoid digital marketing or promotion of BMS online, especially if they are looking for information about or support for breastfeeding (36). Research conducted by Hastings and colleagues quoted a BMS marketing executive, who said that his company "is always on a quest to find ways to identify women who are pregnant for the first time ... first time mothers are the holy grail" (60).

The algorithms make it possible to deliver advertising content that has been tailored and tested to provoke clearly defined consumer behaviours. These behaviours include, but are not limited to, device usage, purchasing, sharing, downloading apps that track users' behaviour, accessing websites or contacting company personnel for advice. Advertisements that drive users to take some measurable action can be used to measure effectiveness and refine content in real time. Furthermore, advertisers can deliver content *when* users are most likely to be influenced by them, even before they actively search for product information. These advanced targeting options enable advertisers to increase the persuasive appeal of their promotions and provide a level of personalization that is not achievable on other advertising channels (59, 61, 62).

In addition to collecting user data from websites and social media platforms, BMS marketers use parenting apps to harvest more identifying data from mothers. These apps encourage mothers to track their baby's feeding and sleeping habits, record their growth, keep journals, seek advice from other users or from

Advertisements that drive users to take some measurable action can be used to measure effectiveness and refine content in real time. Furthermore, advertisers can deliver content when users are most likely to be influenced by them, even before they actively search for product information.

Fig. 4. Example of a feed tracking app that collects information about type, frequency and volume of feeds



Source: DPSA report (38)

company experts and access parenting content. These apps are usually free to download but require users to register by providing personal information.

Parenting apps generate loyalty and build an emotional connection with the brand by offering new parents a range of services. These apps facilitate direct contact between BMS brand personnel while evading public scrutiny. Hastings and colleagues heard from BMS marketing executives that some of these apps included "an online ovulation calculator, to help women get pregnant in the first place" and "an app for mothers to reach other mothers who were up all night, so mothers who have a newborn baby and they are up at three am and they are lonely and bored, could connect to other mothers who are up at the same time and have a chat" (60). Several apps offer access to expert advice, including advice from health professionals.

Fig. 4 depicts some of the content of one such app. This app has been downloaded more than 500 000 times from the Google PlayStore. Aimed at pregnant women and new mothers, the app invites mothers to record information about their infants' feeding details (including time on each breast, bottle feeds, quantity of pumped milk or formula given) and sleeping habits and their own concerns. This information is then used by the BMS advertiser to deliver tailored informational content to mothers. It also solicits direct contact with mothers by offering convenient access to expert advice (including from health care professionals) around the clock and without the need for an appointment or travel to a clinic.

It is a condition of the use of these apps that the information mothers record in them becomes the property of the company that owns the app. These data are analyzed and combined with data available from other sources. The data collected from apps include identifying information, which in turn facilitates more accurate targeting that can link demographic and attitudinal data with the behaviour of app users in real time. Thus, a mother using one of these apps during the night may be targeted with

an advertisement for a BMS product that claims to help babies sleep longer at night.

Timely contacts

Digital platforms also make it possible to identify and target women's most vulnerable moments in real time, facilitating instant contact with pregnant women, mothers and those who influence their feeding decisions. Companies manufacturing or marketing BMS can pay search engines to have their content appear in search results to people who submit queries on these topics, often with the opportunity to make an online purchase immediately. Content that appears to offer information personally tailored to meet mothers' concerns can be delivered at the very moment a woman seeks information on infant feeding. The content of these promotions typically presents a BMS as the solution for challenging but normal infant behaviours like hunger, crying or digestive discomfort, which may be pathologized in order to promote BMS as a medical treatment.

These data can also be used to strengthen BMS marketers' capacity for "building faux-friendships rather than making an overt sales pitch: 'we want to build a relationship with you as a mother, we want to support you, we want you to see us as an ally and we want to subtly insinuate ourselves as your friend and support in a healthy pregnancy and a happy baby'" (60).

Messages in digital media can be instantly disseminated to target audiences, in other words those most likely to be persuaded to purchase, while they are actively engaged in decision-making. Unlike traditional advertising, this content can be instantly converted to a purchase from an online retailer. Because these conversations can occur at any time and can be acted upon instantaneously, purchase intentions are therefore unlikely to change in response to subsequent stimuli, be reconsidered or be subjected to further scrutiny (63–66). Research by Hastings and colleagues revealed that BMS companies "had very good evidence to show that if a woman

is in the [baby club], if a woman has called the [telephone advice line], there is a significant correlation with her ultimately buying [corporation name's] products" (60). All the data entered by parents can be collected and further aggregated to generate insights about parents' values, concerns, interests and, importantly, infant feeding behaviours.

Virtual support groups

A virtual support group or community is a "virtual social space where people come together to get and give information or support, to learn, or to find company" (67). When these are established or used for the purpose of marketing, this is known as community marketing. These communities are established to encourage customers to engage with the brand and not just interact with each other. These interactions provide a rich seam of data that can be used to refine messages, develop marketing insights and more precisely target potential customers. BMS companies routinely establish virtual support groups — known colloquially as baby-clubs or mom-clubs — for the purpose of community marketing.

Traditional marketing communication is a one-way channel, in which advertisements are delivered to passive recipients. Digital marketing, in contrast, engages individuals — including consumers and others who influence purchasing behaviours — in conversations with the brand and, importantly, with one another (61, 68, 69). This activity, which is used to build trust and positive attitudes towards a brand, and therefore the brand's products, may not be widely recognized as advertising or promotion.

In order to engage individuals in conversations, digital advertisers must engage with groups of social media users and the most effective strategy for achieving this is to create their own online communities (59, 61, 62, 69) and attract individuals to join them. These communities may be organized around brands or products but are more commonly organized around shared interests or experiences. BMS brands often establish communities for women expecting or caring for children born during the same month.

Branded online baby clubs offer women a range of materials and information on pregnancy and childbirth, along with free gifts and discounts (38). Baby clubs often include access to carelines which offer 24/7 support and advice, including the opportunity to speak to health professionals and other experts. These clubs may be supported on a social media or private messaging platform, via a free smartphone app or they may encourage cross-platform engagement. For example, apps often direct users to websites or other online platforms where they find content about pregnancy and baby feeding habits.

Online baby clubs are a key focus for the promotion of BMS. Marketing executives report "we had a particular focus on what they call 'one to one marketing' which is reaching mothers individually and building individual relationships with mothers. The two big tools in their arsenal, their two favourite tools, were the [telephone advice line] and the [baby club] ..." (60). These tools collect personal data and create a two-way communication channel. The strategy of the BMS manufacturers is to set up this type of data collection in order to strengthen their Customer Relationship Management (CRM) tools. CRM tools are becoming more and more advanced, allowing brands to deliver apparently personalized messages directly to individual users. For instance,

after registering for an online baby club, a researcher working on the social listening analysis received three email messages that contained content pertaining to a fictitious pregnancy week that was provided at registration. This type of marketing activity aims to establish an emotional connection with the brand by being present with the right information, at the right time. It creates trust by demonstrating an uncanny insight into users' concerns and offering solutions — often products — that consumers do not even know that they need, usually do not need and may cause harm.

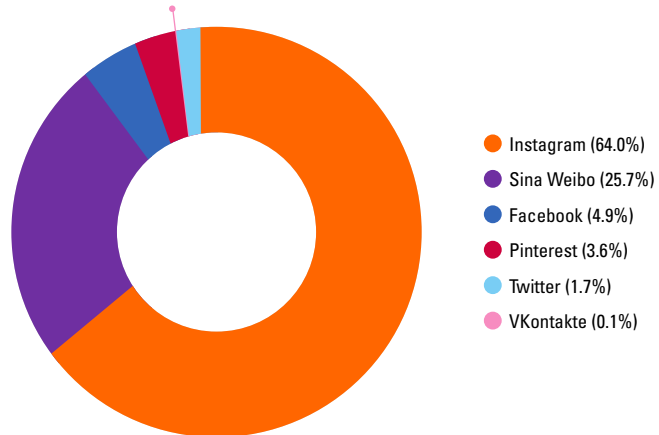
Virtual support groups generate promotional content — as comments, stories, photographs or videos — that appears to arise naturally in the course of conversation amongst peers or friends. This content is often not recognizable as marketing or advertising because it does not look, sound or feel like traditional advertising. Rather it takes the form of spontaneous utterance; authentic, independent advice from trusted peers with shared values, similar experiences, some relevant expertise, or even simply celebrity, that provokes aspirational sentiment in others (63–66).

Content generated in this way is a much more effective driver of brand sentiment and purchasing behaviour than traditional advertisements for several reasons (59, 61, 63–66, 70). For example, it is regarded as more credible than recognizable advertisements and leverages the trust that is generated amongst social networks.

Influencers

Influencers are individuals who generate income (from companies, such as BMS manufacturers) by creating informative or entertaining content to attract followers, in effect creating a digital distribution list that is populated almost exclusively with people who respect or admire them. Influencers are paid to publish content that promotes products and brands to people who hold their endorsement in high regard (64). Influencers are people who build a reputation for their knowledge and expertise on a specific topic, make regular posts about that topic and generate large followings of enthusiastic, engaged people who pay close attention to their views. Brands love social media influencers because they can create trends and encourage their followers to buy products they promote.

Fig. 5. Distribution of branded influencers' content by platform (percentage of posts)



Source: DPSA report (38)

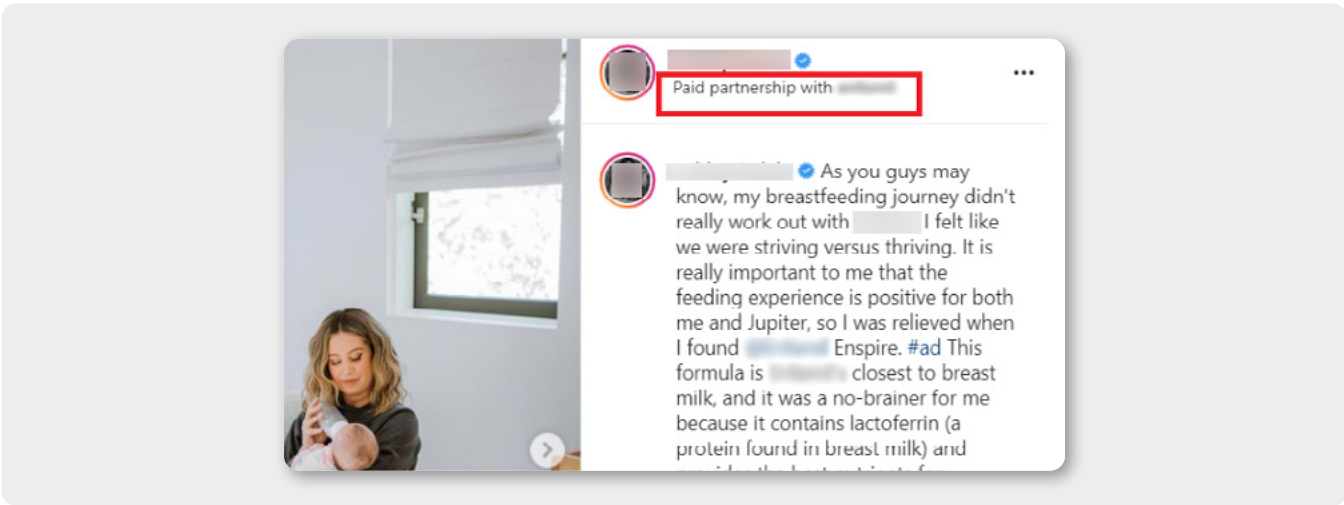
Influencers may be parenting or child health experts or online celebrities. They are perceived by their followers as informed or experienced peers who share values or interests that are similar to their own. This perceived similarity generates trust. Consumers trust influencers almost as much as they trust their own friends or family (66) and more than they trust advertisers (63).

Promotional content that influencers produce and disseminate to their followers is perceived as more credible and trustworthy than traditional advertising content (65). While most consumers actively avoid advertisements (71), Ahmad and colleagues found in 2018 that more than 90% of consumers trust recommendations from peers and only 33% trust traditional advertisements (63). It is well understood that influencers affect their followers' purchase decisions (65, 68).

Influencers promote BMS products to their followers on social media platforms (38). In order to identify influencer-generated promotions, the social media listening research captured posts that mentioned BMS brands or products and were published on accounts held by individuals. Each of these posts was analysed manually to distinguish incidental mention of a product or brand from repeated, promotional content or advertising copy.

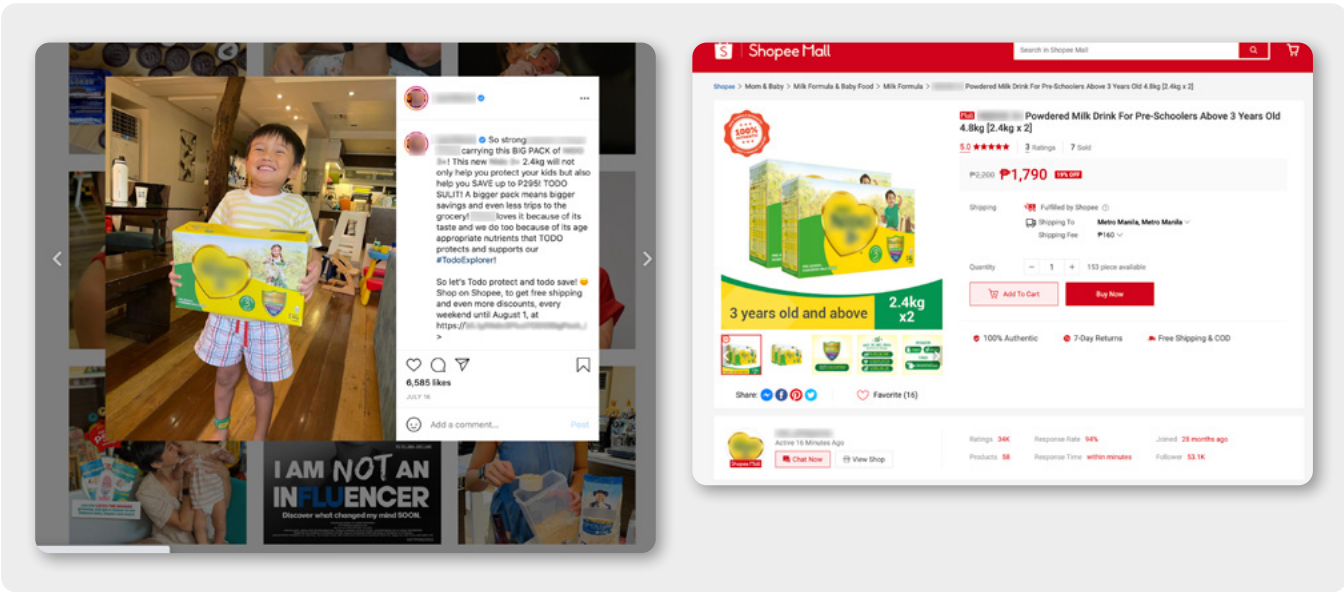
BMS promotions published by influencers were most prevalent on Instagram and Sina Weibo (Fig. 5). Between January and July 2021, 434 influencers were observed who promoting a BMS brand or product. More than 200 branded posts were posted by individuals on Sina Weibo and these posts reached more than 6 million people and generated 1.8 million interactions (38).

Fig. 6. Example of an influencer promoting a BMS product — Ashley Tisdale promoting infant formula on Instagram



Source: DPSA report (38)

Fig. 7. Example of a transnational influencer promoting young child formula products



Source: DPSA report (38)

Influencers were most active in China (210 influencers), Indonesia (181), United States of America (89), Malaysia (39), Cambodia (25), France (24) and Russia (23). Posts most commonly mentioned BMS brands or products owned by Danone (32.4% of posts) followed by Mead Johnson (14.9%), BMS (12.3%), Abbott (6.48%), Feihe (3.13%) and Yili (2.2%).

Influencers' posts can reach millions of users and generate hundreds of thousands of interactions. Half of the influencers (231) identified in the social listening research had more than a million followers (38). One celebrity influencer, for example, reached more than million people and generated 155 000 engagement actions with a single post that appears to have been sponsored by a BMS brand (Fig. 6).

Table 5. User reach per post by source of post

REACH PER POST ('000)	
Branded* influencer posts	163
Unbranded influencer posts	26
Natural communities	27
Expert media	24
Hospitals	9
Health workers	11
Retailers	13
BMS manufacturers	40

*sponsored by BMS brand
Source: DPSA report (38)

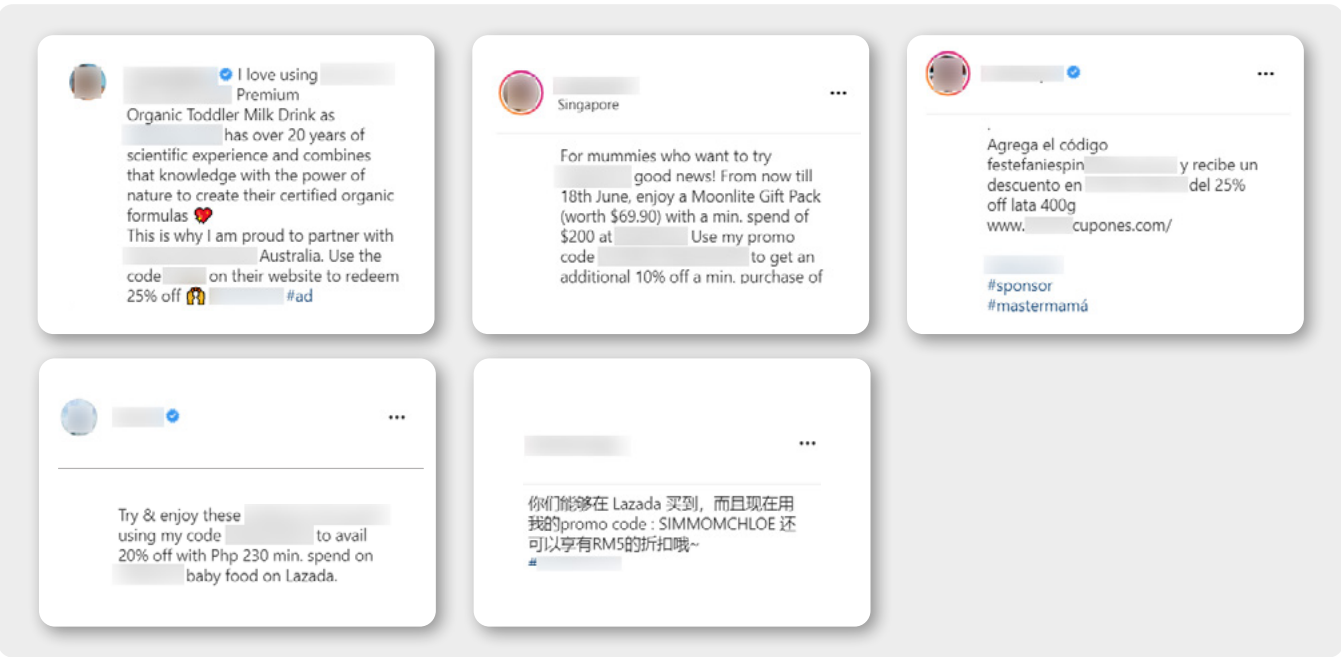
Influencers can reach across national borders and appeal to parents living outside their home countries. Fig. 7 illustrates content created by a Filipina-Australian who lives and works in the United States. Her content is designed to engage Filipina mothers. She identifies herself as a Nestlé brand ambassador, and she offers discount codes for retailers in the Philippines who ship their products to the United States (38).

Promotions of BMS published by influencers reached more users than advertising content published by BMS brand accounts. The influencers identified for this study published an average of two posts that promoted a BMS brand or product during the study period ($n=864$ posts). These posts reached 170 million people and generated almost 5 million engagement actions, equal to an engagement rate of 3%. This engagement rate is two to three times greater than is usually expected of a promotional post. On average, a single BMS promotion published by an influencer was viewed by more than 163 000 people and provoked around 11 000 interactions (38).

Influencer posts about infant feeding reach four times as many users as content published by BMS brands and almost 10 times as many users as infant feeding content posted to other user groups (Table 5). Thus, most of the infant feeding content that pregnant women and mothers see online appears to be generated for the purpose of promoting BMS products or brands.

Influencers who promote BMS products or brands may not be paid directly for posting BMS promotions. However, because digital technologies make it possible to identify sales that are generated by their posts, influencers earn a commission on those sales. Fig. 8 shows BMS promotions published by influencers. Digital codes included in these posts enable advertisers to track the source of a purchaser's referral and only pay the influencers for promotional content that generates sales revenue (38).

Fig. 8. Screenshots of examples of customized discount codes published by influencers



Source: DPSA report (38)

User-generated promotions

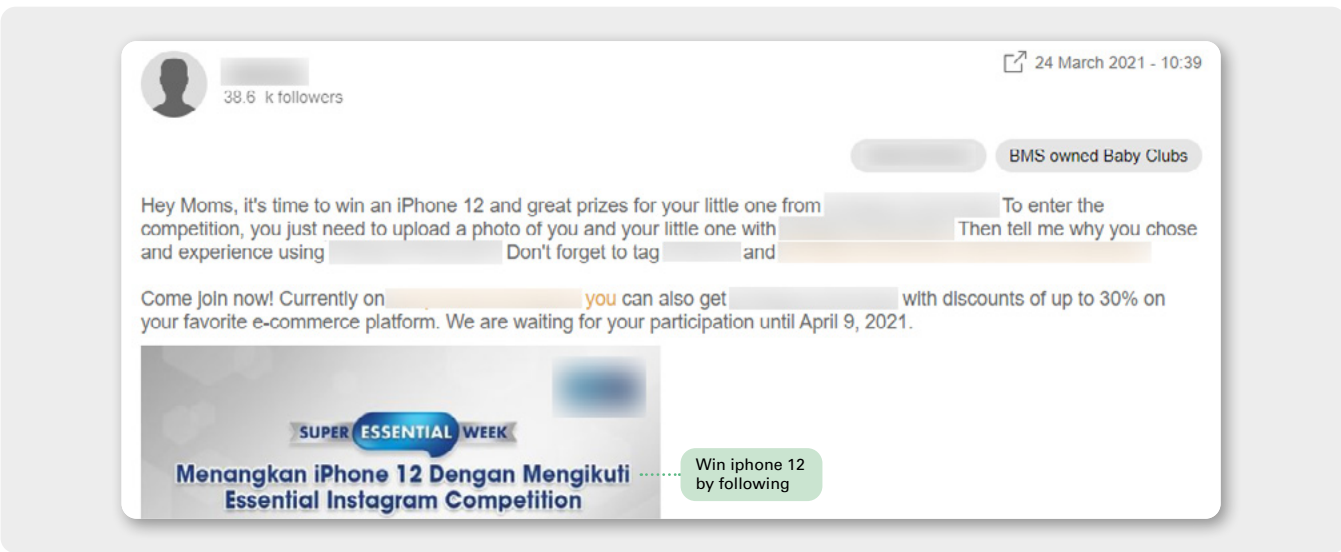
Unlike traditional media that distributes advertising messages to passive recipients, digital platforms enable advertisers to engage users in the process of content generation (68). Encouraging audiences to generate content that promotes a brand or product enables advertisers to neutralise consumers' tendency to ignore or distrust advertisements.

This content does not look or sound like traditional advertising and may be more persuasive because it seems to come from a trusted source independent of the advertiser. Importantly, user-generated promotions also encourage people to tag their friends in the comment section in order to increase the advertiser's reach to new users with similar interests. Tagging a friend means that the person will receive a notification and the post will appear on the friend's newsfeed. When a person posts or shares this user-generated content it is distributed to their friends.

User-generated promotions often take the form of a competition that offers a chance to win a prize in return for generating and sharing promotional content. Fig. 9 provides an example of a BMS promotion that encourages users to generate and share an advertisement in return for a chance to win a luxury smartphone. As is typical of this type of promotion, users are encouraged to post photographs of their children and text endorsing the product. Users are also encouraged to join an online marketing club in return for a large discount on BMS purchases (38). This post was disseminated from at least 17 influencer accounts and includes a request to use hashtags that enable advertisers to track the reach of the campaign and identify relevant audiences (Fig. 10).

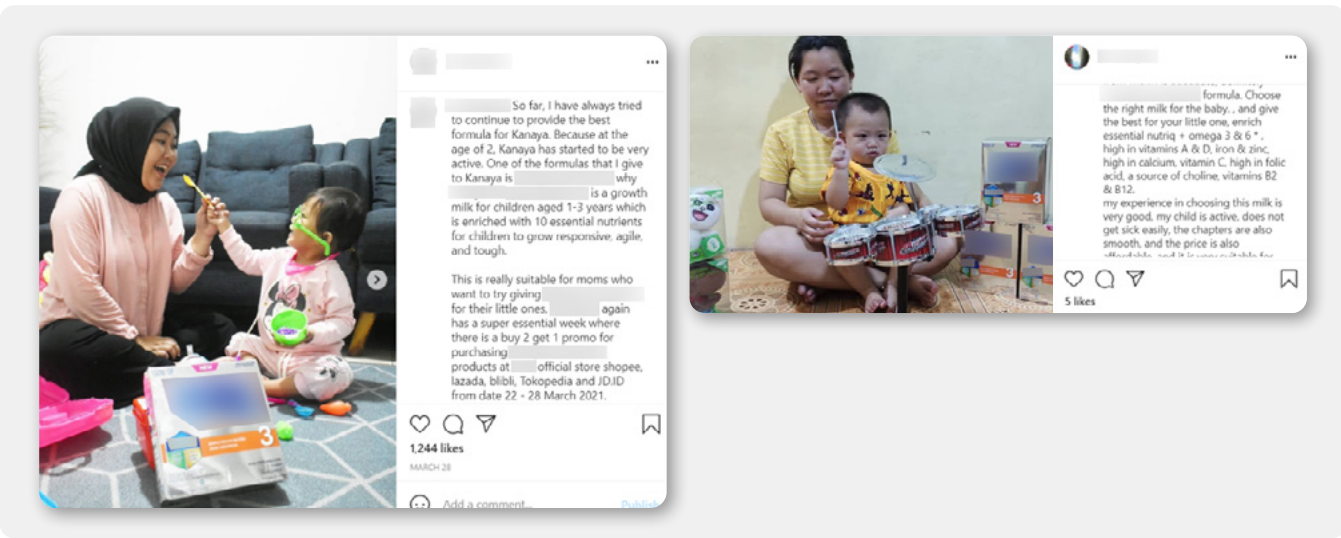
BMS manufacturers' accounts use comments to increase the reach of their advertising content in a process known as boosting. This means that advertising algorithms distribute

Fig. 9. Example of a promotional post for a formula brand launching a competition (#SuperEssentialWeek)



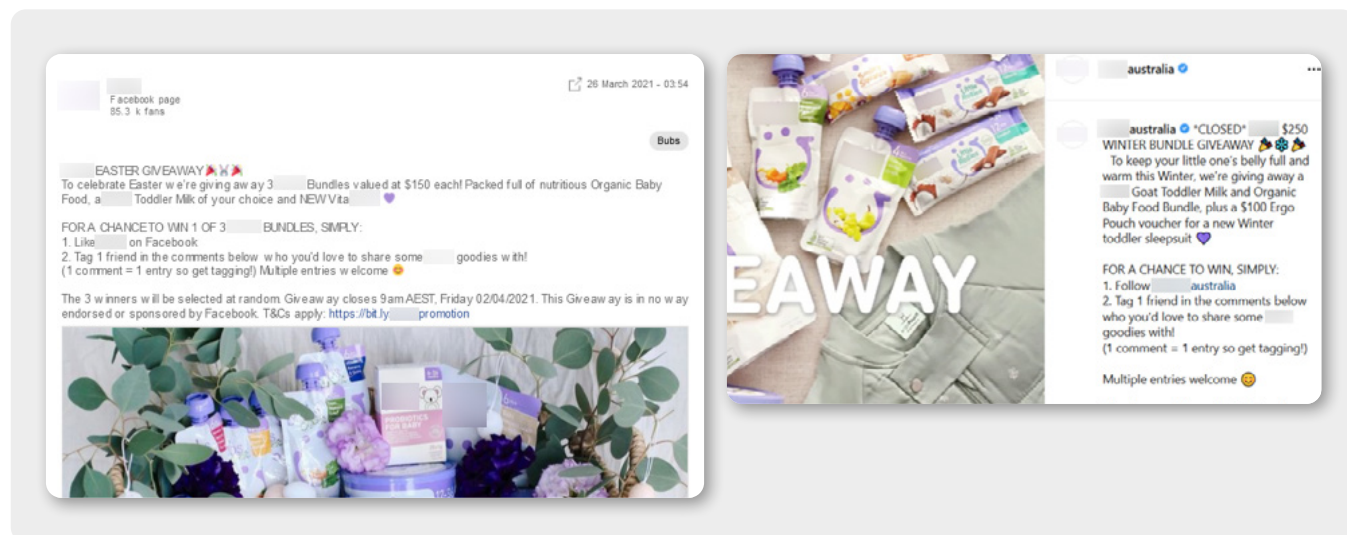
Source: DPSA report (38)

Fig. 10. Examples of responses to the #SuperEssentialWeek contest



Source: DPSA report (38)

Fig. 11. Example of competition posts from a BMS brand



Source: DPSA report (38)

posts that generate a high volume of comments to more users' timelines or newsfeeds. The social listening research commissioned for this report identified and monitored 264 social media accounts owned by BMS manufacturers between January and June 2021. These accounts published 77 200 posts on social media during the monitoring period (not including dark posts that cannot be captured by SMIPs or other social media monitoring tools). The vast majority (80%, 61 600 posts) of these were comments or replies. One account owned by a BMS brand in Indonesia posted 29 800 comments but only published 251 advertisements. A second account owned by the same company posted 14 300 comments and 36 published advertisements. Almost 80% of BMS manufacturers' posts collected were comments they made on their own posts or replies to their own tweets (38).

An Australian social media campaign captured in the social media listening research is illustrated in Fig. 11. This campaign was conducted simultaneously on Facebook and Instagram and featured two competitions during the six-month monitoring period. This campaign encouraged users to comment on a post published by a BMS brand account and tag their friends in return for chances to win prizes. These engagement actions increase the audience for this and subsequent posts and trigger the advertising algorithm to disseminate the post to users with similar demographic and behavioural profiles.

The first competition post (left) reached 5 000 people and achieved an engagement rate of 33%, which means that a third of the users who saw the post acted on it by liking, sharing, commenting or clicking through to the brand account page. The second competition post (right) achieved an engagement rate of 10%. While significantly lower than achieved previously, it is still well above the benchmark engagement rate of 1–2% per post (72). Together, these competitions reached 22 000 people, generated more than 3 700 comments and increased this advertiser's reach to thousands of new parents.

Information and education

BMS companies appear to be positioning their brands as

the "go-to destination for your customers, whether it be for entertainment, education, or inspiration. Effective content will help you to build long-term relationships with your audience, ultimately leading to an increase in revenue for your organization (73). Only 50% of the content published by BMS brand online accounts mentioned infant feeding explicitly in the social listening research commissioned for this report (38). The remaining content addressed related topics of interest to new parents and focused on themes that are repeated in their advertising content.

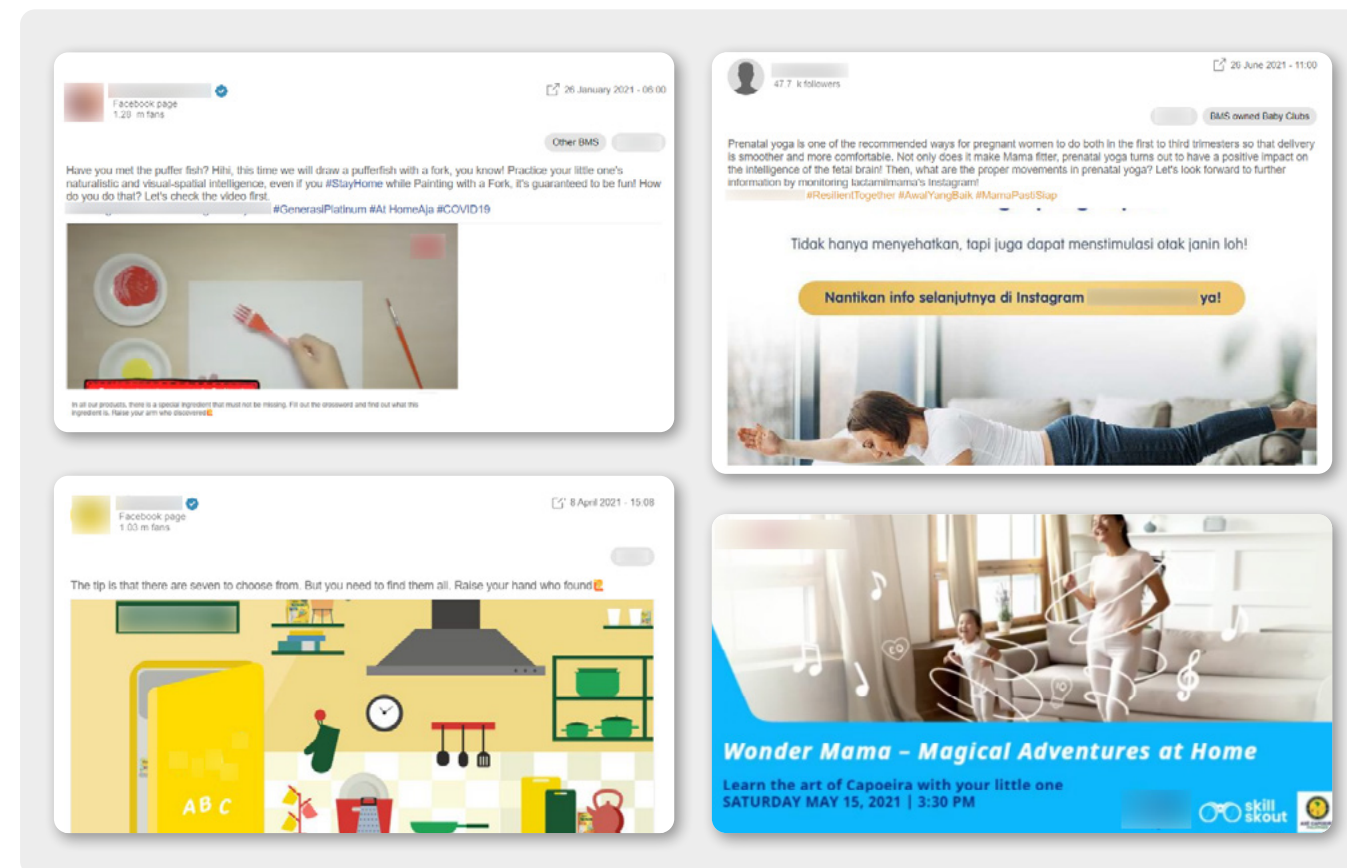
BMS brand accounts actively engage with users on social media, answering their questions or adding product promotion in comments on users' posts. Almost 80% of BMS manufacturers' posts captured are comments they made on their own posts or replies to their own tweets. Although BMS brand accounts are most active on social media in Indonesia, Japan, United States, Malaysia, United Kingdom, Spain and France, this trend is most visible amongst BMS brand accounts based in Indonesia.

In addition to publishing content about their own brands and products, the social listening research found that all BMS brand accounts published content about breastfeeding (38). Therefore, mothers who search for information about breastfeeding or support for breastfeeding are likely to be exposed to content that directs them towards a BMS brand.

Around 3% of posts by BMS manufacturers that did not contain explicit reference to a BMS product were invitations to live information or education events or video replays of these events (38). The topics addressed in these events are very diverse, from live sales promotions and invited experts to in-house experts and celebrities that talk about specific topics on the BMS account live channels such as Facebook, YouTube or Instagram IGTV (see Fig. 12).

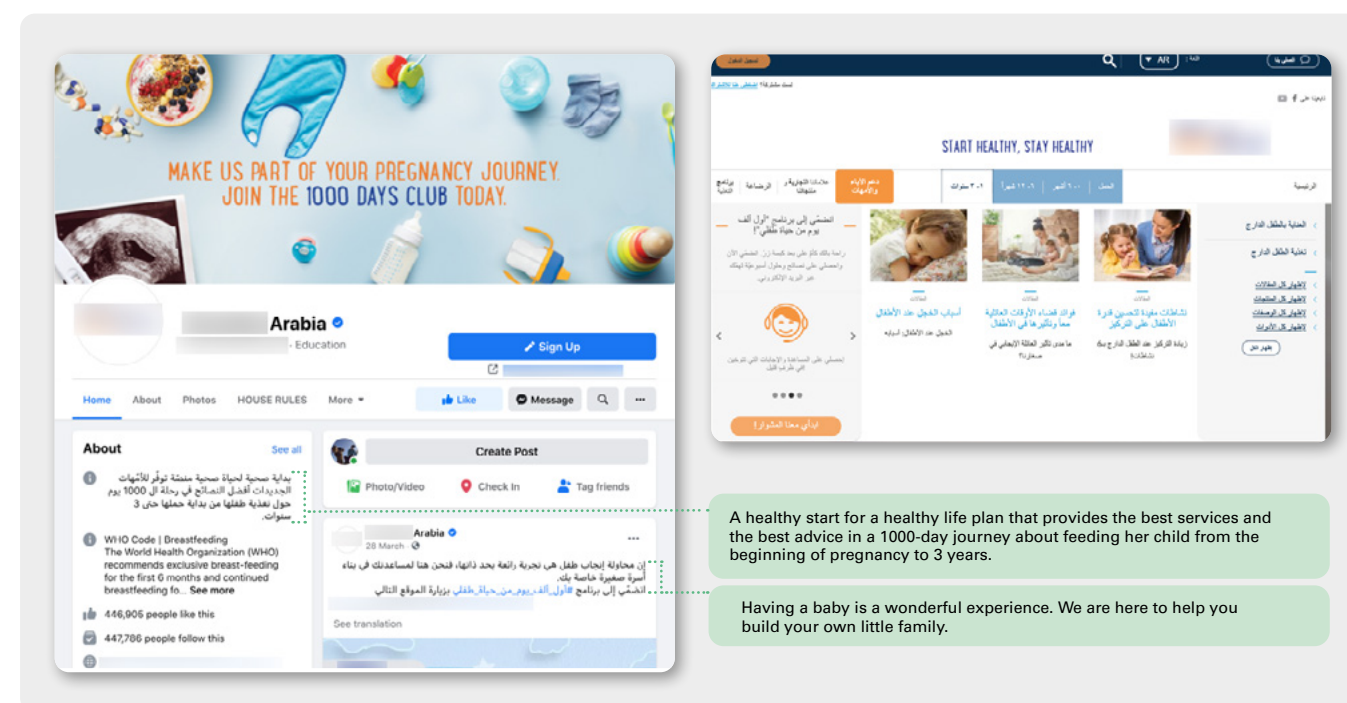
These types of promotions are widely used in social media to encourage users to engage with the brand, interact with other users and create a community. This establishes an emotional connection with the brand beyond the product itself (68).

Fig. 12. Screenshots of examples of creative and entertainment activities suggested by BMS brands



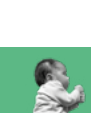
Source: DPSA report (38)

Fig. 13. Examples of a pan-Arab communication strategy for a BMS manufacturer



A healthy start for a healthy life plan that provides the best services and the best advice in a 1000-day journey about feeding her child from the beginning of pregnancy to 3 years.

Having a baby is a wonderful experience. We are here to help you build your own little family.



Transnational nature of digital marketing

Digital marketing platforms enable advertisers to reach beyond national borders. It can be more cost effective to disseminate marketing content to more than one country from a single office than to create novel content in every country. In the example below, one baby club and Facebook page is used to promote a BMS brand across all Arabic-speaking countries across several platforms (see Fig. 13).

BMS manufacturers go beyond language in the transnational messaging strategy if any one market is not lucrative enough, and sometimes use a single strategy across an entire region. Fig. 14 demonstrates one communication strategy used to reach the entire Caribbean region and Fig. 15 demonstrates another strategy using a single YouTube channel for Latin America (38).

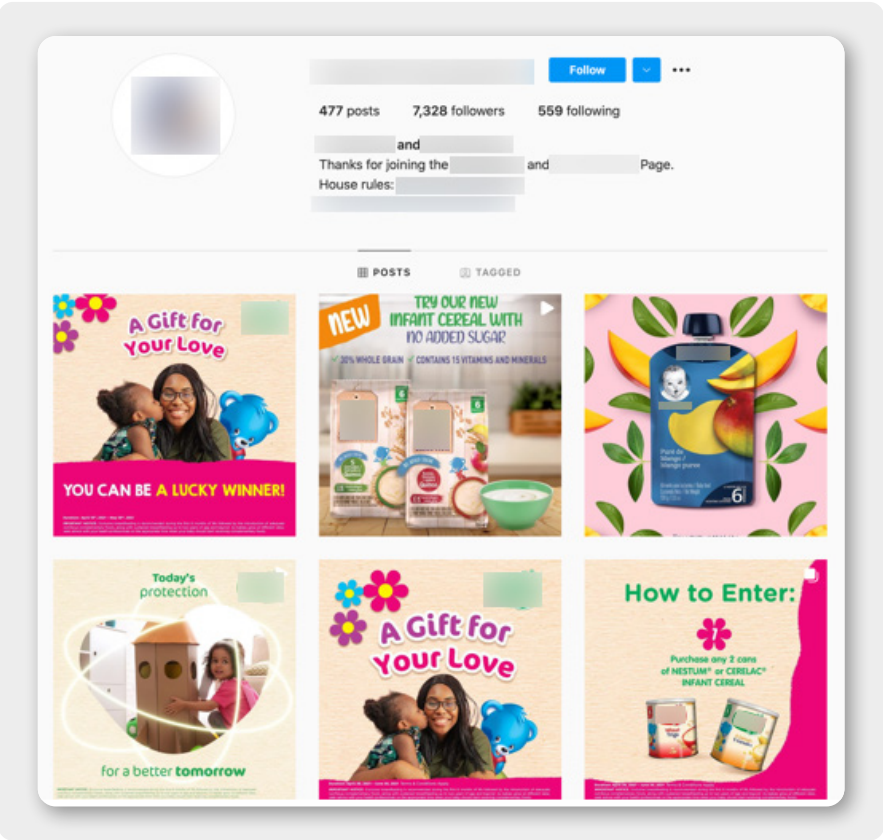
Digital environments record vast amounts of data about the people who use them. It is virtually impossible to use social media, search the internet for information, or visit a website without leaving digital footprints behind. These data are a valuable commodity that enables advertisers to purchase direct access to precise audiences of users, including pregnant women and mothers. BMS manufacturers and distributors use a variety of digital communication strategies to encourage pregnant women and mothers to divulge personal information that can be used to engage them directly with BMS promotions. Powerful algorithms enable advertisers to deliver these BMS promotions during key decision points in mothers’ infant feeding journeys.

This information enables marketers to identify moments of vulnerability when concerns and questions can be instantly converted to a purchase from an online retailer.

Digital marketing creates opportunities to promote products in ways that may not be widely recognized as advertising or promotion. Online baby clubs are a key focus for the promotion of BMS because they allow the companies to engage pregnant women and mothers in direct conversations and to build brand loyalty by cultivating emotional connections with them. Offering instant access to advice about feeding enables company employees to influence infant feeding decision directly while also populating marketing contact databases. Social media Influencers cultivate audiences who perceive them as peers, people who share their values or interests and are often seen as experts in parenting or health care or simply as worthy of emulating. Product recommendations made by influencers are perceived to be much more credible than advertisements even though these influencers have paid relationships with commercial entities. Parents, generally mothers are enticed to generate their own product promotions or amplify messages with competitions and special incentives.

Digital marketing platforms also enable advertisers to reach beyond national borders. It can be more cost effective to disseminate marketing content to more than one country rather than to create novel content in every country. This also helps to evade national restrictions on BMS promotion.

Fig. 14. Example of a BMS manufacturer’s cross-Caribbean communication strategy to promote baby foods



Source: DPSA report (38)

Fig. 15. Example of a BMS manufacturer’s single YouTube channel for Latin America



Source: DPSA report (38)

5. Code legislation

Article 5.1 of the *International code of marketing of breast-milk substitutes* specifies that there should be no advertising or other form of promotion of BMS to the general public (5). While Article 5.1 would logically include the promotion of BMS on digital platforms, the Code does not address many digital marketing strategies for the promotion of BMS specifically. The Code does not currently address, for example, data mining to identify and target pregnant women and mothers, the use of digital technologies to place promotions in direct response to concerns expressed online by pregnant women and mothers, the responsibilities of influencers and social media platforms, the status of user-generated promotions or the use of BMS manufacturer or brand apps and other platforms that provide parents with parenting information. Furthermore, national legislation rarely addresses any of these marketing strategies.

Only 37 of 194 countries (19%) explicitly prohibit promotion of BMS on the internet, digital channels or other electronic means (Table 6). In most cases, this explicit mention of digital media is limited to the definition of advertising or mentioning digital media in the text prohibiting general promotion to the public. None of the legislation that prohibits BMS promotions explicitly excludes digital marketing for the promotion of BMS. However, clarification may be required to ensure that digital marketing strategies used for the promotion of BMS are included in legal definitions of advertising or promotion. In Botswana, South Africa and Tanzania, the national Code legislation prohibits indirect contact via electronic communications. Legislation in Egypt specifically prohibits electronic hotlines or programmes to counsel women and their families on infant and young child feeding. South Africa is the only country to explicitly cover virtual retail outlets in the prohibition of promotional devices.

Whether other types of digital promotions are captured by the Code or national measures designed to implement it is less clear. While social media influencers promoting BMS appear to violate Article 5.1 of the Code (Promotion to the General Public and Mothers) they, or BMS companies, might argue that content produced by influencers is not advertisement because it is not generated by a BMS advertiser but by an individual sharing their experiences or views of product or brand. Similarly, BMS companies that seek contact with mothers by establishing or participating in online social networks in order to engage mothers and others in conversation appear to violate Article 5.5 of the Code which states, “Marketing personnel, in their business capacity, should not seek direct or indirect contact of any kind with pregnant women or with mothers of infants and young children.” Because BMS companies might argue that establishing online brand communities, parenting clubs, virtual support groups and professional advisory lines does not necessarily involve human-to-human interaction and therefore does not constitute “contact of any kind” regulatory clarification may be required. When these online networks or clubs are used for establishing trust or generating brand loyalty, or increasing the reach of marketing campaigns to promote BMS products, they would more clearly meet any reasonable definition of promotion of BMS.

Digital technologies enable advertisers to evade scrutiny from enforcement agencies because promotions can be delivered to personal accounts without ever being published on broadcast media. Additional laws or regulations may be required to hold BMS manufacturers and distributors to account for promotions generated in virtual support groups by the general public and mothers, including social media influencers, who are not direct employees or contractors of those companies.

Table 6. Digital marketing strategies covered in national legislation on BMS Code of marketing

PROVISION	NUMBER OF COUNTRIES
No existing Code legislation	58
Digital media not mentioned in Code legislation	99
Internet or other electronic media mentioned in Code legislation	37
Digital media explicitly included in definition of advertising	28
Digital media explicitly mentioned in prohibition of promotion	6
Prohibition on general indirect contact includes digital media	3
Internet help lines prohibited	3
Online mother/baby clubs prohibited	3
Online baby competitions prohibited	2
Electronic communications via email, websites prohibited	3
Online counselling programmes prohibited	1
Promotional devices in online retailers prohibited	1

6. Monitoring and Code enforcement

Digital marketing strategies for the promotion of BMS pose unique challenges for monitoring and enforcement (74). Advertisements, special sales or invitations that are not broadcast publicly but appear only on the screens of precisely identified users are difficult to detect. The origin of online messages is more difficult, and costly, to establish, making it more challenging to hold the responsible party accountable. In addition, digital media platforms facilitate distribution of promotional content across national borders, making it difficult for national governments to hold manufacturers and distributors accountable for digital BMS promotions.

Accounts owned by the BMS industry rarely refer to a formula milk product explicitly in their advertising communications. Rather, they refer to a group of products, known as a product line or a brand, that includes infant formula and may include a range of other products suitable for infants and children under 2 years of age. Content that refers to formula milk products comprises less than 1% of the BMS manufacturers’ total conversation (see Fig. 16). This is consistent with modern marketing practices informed by a large body of evidence demonstrating that effective marketing prioritizes brand promotions over product promotions (75).

BMS manufacturers’ product promotions refer to formula milk products suitable for infants from the age of 6 or 12 months much more often than formula milk products suitable for infants from birth. This practice is known as line extension (76) or cross-promotion, and is used to circumvent regulations that

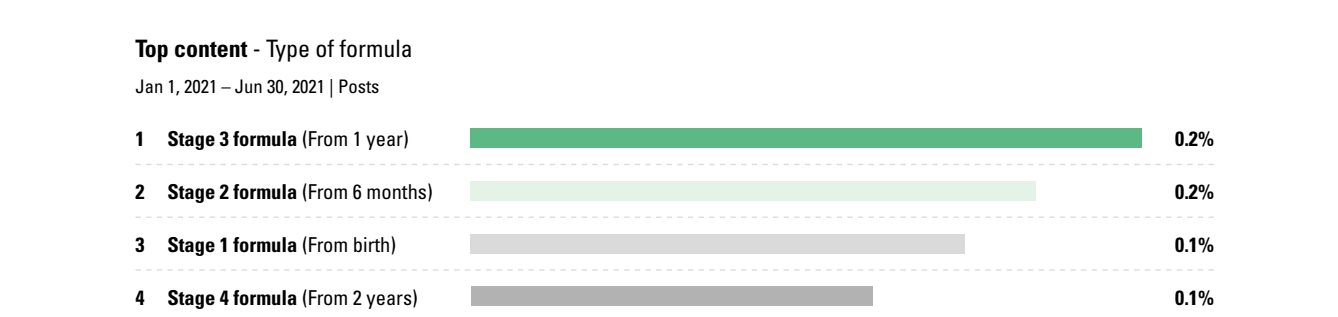
prohibit the promotion of infant formula products suitable for infants up to 6 or 12 months of age (see Fig. 17).

The Australian Competition and Consumer Commission (ACCC) has observed that the promotions of later stage formula products — for young children — can undermine voluntary and legislative measures that restrict the promotion of infant formulas. As stated by ACCC, the BMS manufacturers “market toddler milk in almost identical packaging and branding to infant formula, with numbered ‘stages’, as part of a consistent product line. Because of these links, advertising for toddler milk can also promote infant formula” (77). *The packaging similarity is a way of promoting the family of products (from stage 1 to 4) and still “technically” complying with the regulations* ((76,78–79).

Although Article 5.5 of the Code proscribes marketing personnel from seeking direct or indirect contact of any kind with pregnant women or with mothers of young children, accounts owned by BMS accounts invite consumers that post comments about formula milk in markets where promoting those products is prohibited or restricted to use a private messaging service (Fig. 18). Data protection measures generally prevent external agencies from accessing private messaging services, which creates another challenge for monitoring and enforcement.

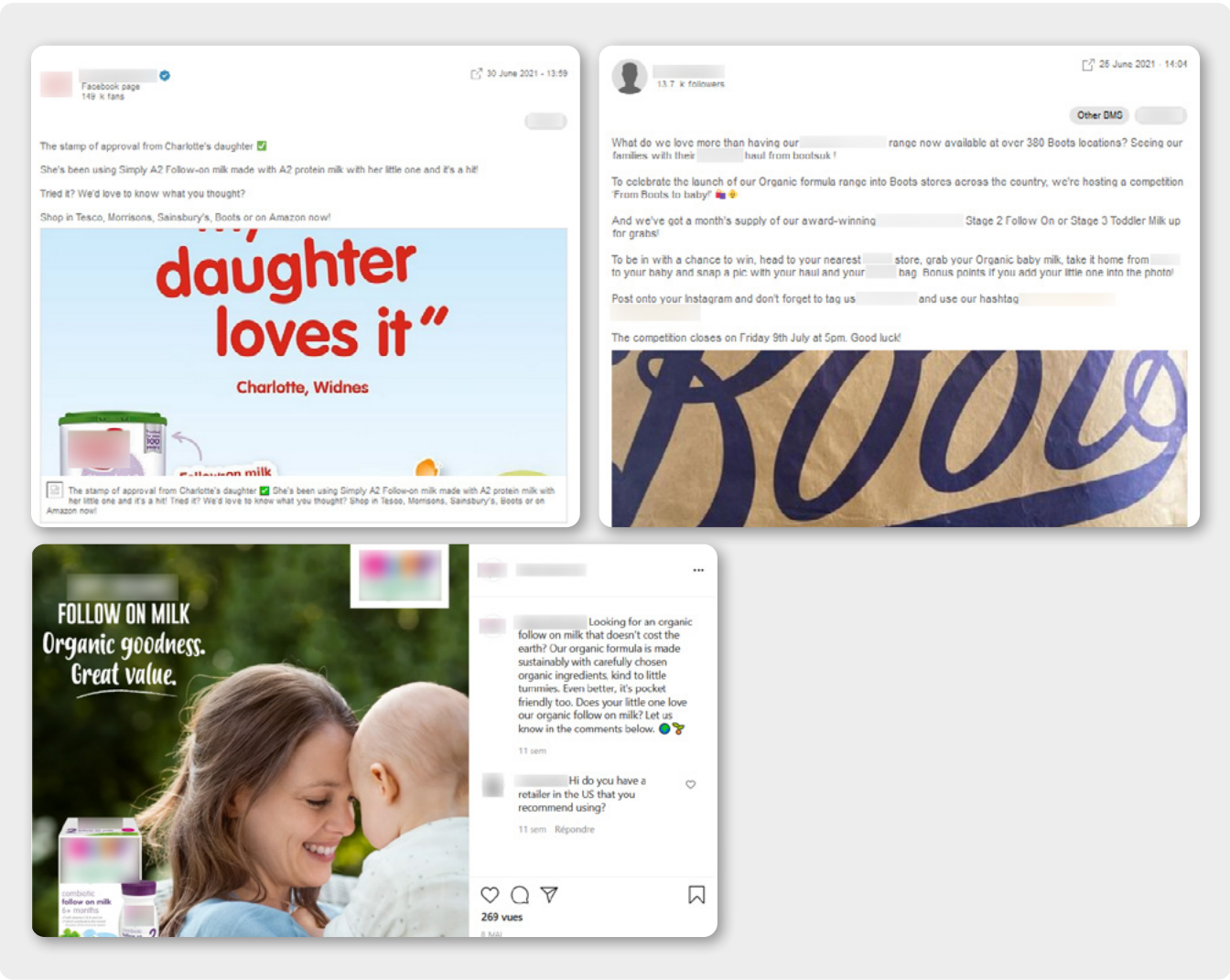
Free parenting apps solicit contact from mothers by offering access to professional advice around the clock. Mothers can access a midwife on the app when their own health

Fig. 16. Percentage of BMS manufacturers total conversation by product type (percentage of posts)



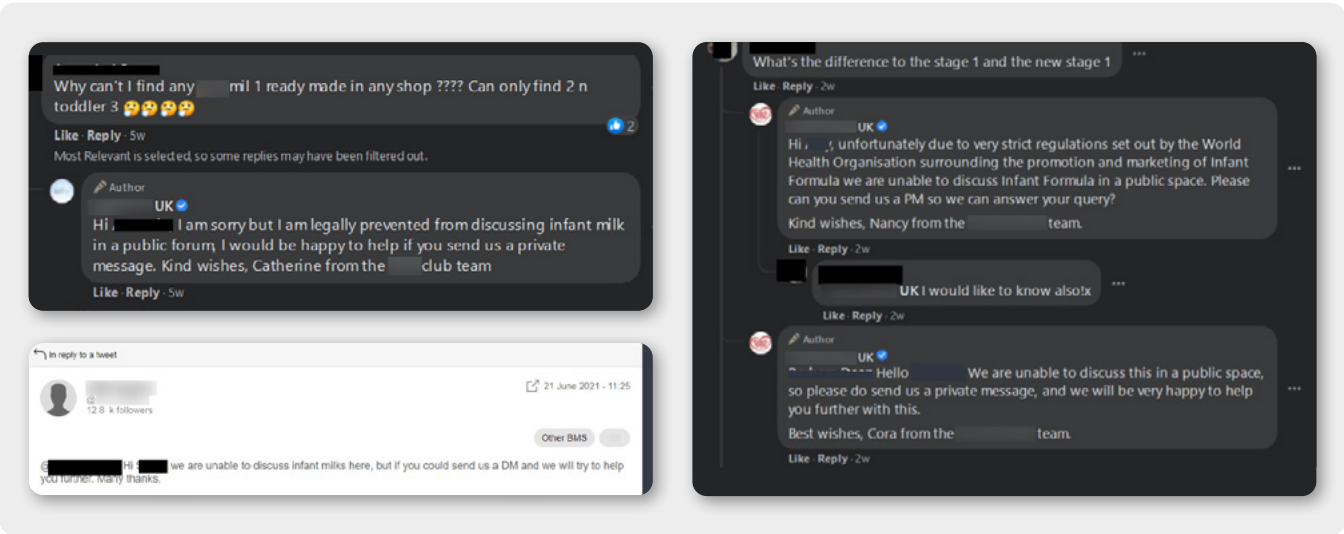
Source: DPSA report (38)

Fig. 17. Examples of promotional content for follow-up formula products in the United Kingdom



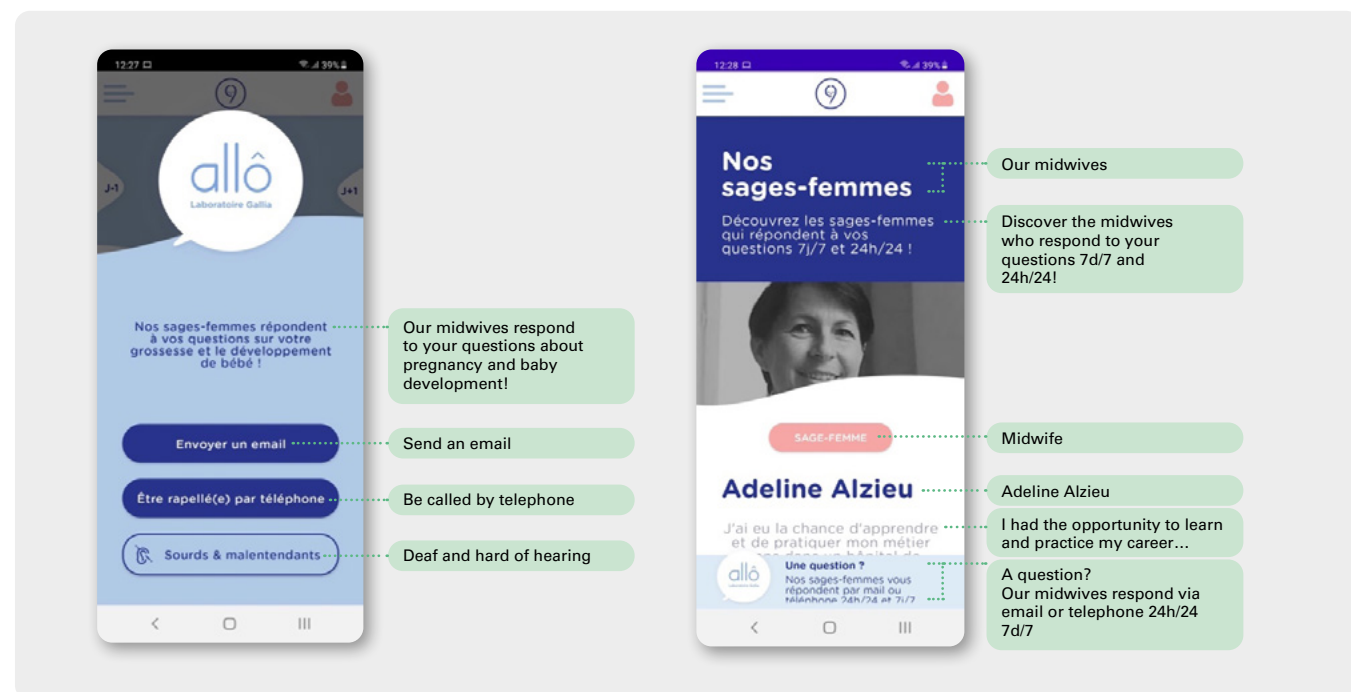
Source: DPSA report (38)

Fig. 18. Examples of invitations for consumers to contact BMS manufacturers via private messages



Source: DPSA report (38)

Fig. 19. Examples of advice services provided on a BMS manufacturer's app



Source: DPSA report (32)

professionals are not available. The benefits of an app for BMS manufacturers go beyond the additional data collection and the direct contact with the consumer (Fig. 19). The apps create private spaces, hidden from authorities that monitor their content for BMS promotions.

Sponsored content, including BMS promotions, may not be easy to distinguish from independent content. In 2017 the United States Federal Trade Commission issued a warning calling for promotional content to be clearly identified on social media (22). A manual review of Instagram posts about infant feeding that appeared in the United States market was conducted to determine the effect of this measure (38). *All of the 20 posts that generated the highest engagement contained promotional content (i.e., image of or reference to a BMS product or brand) and none of them were labelled as sponsored content. In the social listening research commissioned for this report no declaration of paid partnership was observed in posts from any countries where it was not required.*

This type of declaration is not captured by SMIPs, so a manual review has been done on Instagram, excluding the posts identified for advertisement hashtags and promotional codes. Of the top 20 posts that had the highest level of engagement, none mentioned a specific partnership with a brand, despite the obvious promotional content of the publication. This is even more evident in some markets, such as Indonesia, where no mention of paid partnership was observed during the analysis.

The origin of online messages is more difficult, and costly, to establish, making it challenging to hold the responsible party accountable. In addition, digital media platforms facilitate distribution of promotional content across national borders, making it difficult for national governments to hold manufacturers and distributors accountable for digital BMS promotions.

7. Policy implications

Technologies that were unimaginable when the Code was written in 1981 can now harness the power of big data to normalize artificial feeding, contradict breastfeeding promotion and undermine confidence in breastfeeding. Industry-sponsored online support groups, individually-targeted and tailored BMS advertisements, paid parenting blogs and vlogs, parenting information websites, podcasts, smartphone applications, immediate access to advice and support from BMS employees and online retail promotions are increasingly reported.

Digital marketing strategies commonly used today dramatically increase the reach and impact of BMS promotion. Digital technologies that have emerged in recent decades have created new strategies that are powerfully persuasive, extremely cost effective and often unrecognizable as advertising. Although the Code clearly prohibits all promotion of BMS to the general public and mothers, modern digital technologies were not envisioned when the Code was written in 1981. Existing legal measures for implementing the Code and strategies used to monitor and enforce them may need to be updated in order to adequately protect mothers and infants from harms caused by digital marketing of BMS, which is inappropriate.

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Mothers and those who influence their infant feeding decisions are precisely targeted through the application of algorithms driven by enormous data sets generated by social media users. This dramatically increases the power of advertisers to reach consumers and shape their behaviour. This technology enables BMS advertisers to identify pregnant women and mothers interacting online, identify their deepest concerns by engaging them in conversation, exploit their most vulnerable moments,

disguise their marketing content as information or advice and enlist people women respect most to influence their infant feeding choices.

Manufacturers and distributors can use digital platforms to feed BMS promotions directly to the screens of pregnant women and mothers, respond instantaneously to individual concerns, use respected influencers to shape mothers' feeding decisions, generate word-of-mouth endorsements for BMS products and establish online support groups to build positive associations with their brands. These low-cost and effective methods are known to increase purchasing behaviour as measured by sales.

It may be of little consequence that detecting direct relationships between exposure to promotions and health behaviours, such as infant feeding, in populations that are saturated in marketing is challenging (80–82). Almost 20 years ago Hodgetts and colleagues described efforts to measure immediate or short-term effects of advertising as futile, noting that “media effects occur gradually across messages over extended periods” (83). Indeed, the power of marketing is in reinforcing and normalising accepted, and often unhealthy, behaviours (84–86). Built on a foundation of empirical research, these authors observe that the small effects of exposure to media communications observed in individuals are much less important than the indirect influence of mass exposure, which influences social norms and policy agendas through the revision and reinforcement of attitudes and behaviours that favour unhealthy behaviours, such as unnecessary formula feeding (86).

Renaud and colleagues proposed that the content disseminated via mass media, including advertising and marketing content, fosters the development of shared understandings of health and its determinants (87). In the case of infant feeding, analyses conducted across multiple disciplines have demonstrated that exposure to BMS promotions during the latter half of the 20th century had a deleterious impact on infant feeding practices. Digital marketing presents new challenges for monitoring and enforcement of national legislation, particularly when the marketing originates outside of the country. Strengthened legislation, new monitoring and enforcement strategies and transnational legal frameworks are urgently required to protect breastfeeding and safeguard the health of mothers and babies.



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Annex 1: Steering Committee

Expert	WHO region	Areas(s) of expertise
Catherine Pereira-Kotze BSc(Med)(Hons), MNutr School of Public Health University of the Western Cape South Africa	African	Community nutrition and public health International Code implementation and monitoring Infant and young child feeding programme implementation
Katherine Shats LLM (Global Health) BSc/LLB (Hons) Legal Specialist, Nutrition Section UNICEF United States of America	Global	Global health law and advocacy
Paul Zambrano MD MSc (Nutrition for Global Health) Regional Technical Advisor Alive & Thrive SE Asia Philippines	Western Pacific	Code implementation, monitoring and enforcement / digital ecosystems Code legislative advocacy and technical support Public health nutrition
Duong Vu BA (International Economics) Viet Nam Program Manager Alive & Thrive SE Asia Viet Nam	South-East Asia	Digital tools for Code monitoring and enforcement
Cristiano Siqueira Boccolini PhD Pesquisador em Saúde Pública Public Health Researcher Laboratório de Informação em Saúde Instituto de Comunicação e Informação Científica e Tecnológica em Saúde (Icict/Fiocruz) Professor do Programa de Pós-Graduação em Epidemiologia e Saúde Pública Escola Nacional de Saúde Pública/Fiocruz Contato / Contact: Av. Brasil, 4.365 - Pavilhão Haity Moussatché - Manguinhos, Rio de Janeiro - Brasil CEP/Postal Code: 21040-900 Telefone/Phone.: +55 (21) 3865-3258	Americas	Data science Maternal and child nutrition
Svetlana Makarova MD Head of the Center of Preventative Pediatrics in the National Scientific Center of Children's Health Ministry of Health of the Russian Federation Russia	European	Code implementation Paediatrics Preventive health Maternal and child nutrition
Sandra C Jones PhD BA, MBA, MPH, MAssessEval, Pro-Vice Chancellor, Engagement Founding Director Centre for Health and Social Research (CHaSR) Australian Catholic University Australia	Western Pacific	Marketing Social marketing Health behaviour change communication Public health policy
Emma Boyland PhD (Psychology) Senior Lecturer Institute of Population Health University of Liverpool United Kingdom of Great Britain and Northern Ireland	European	Consumer psychology Commercial determinants of children's diets Prevalence and impact of food advertising

Annex 2: Systematic review results

Table A2.1. Summary of included publications (peer reviewed studies and independently published reports)

Author and year of publication	WHO Region	Study design	Study setting	Study category (scope/ impact)	Study population	Digital marketing channel or platform
Abrahams, 2012 (88)	Region of the Americas	Content analysis	United States	Scope	NA	Social media (Facebook, MySpace, Twitter, Youtube, Google+), blogs, mobile applications, interactive websites
Bartolini et al., 2009 (89)	Region of the Americas	Cross-sectional study	Brazil	Scope	NA	Websites
Bass (90)	European Region	Qualitative study	United Kingdom	Scope	NA	Manufacturer websites
Berry and Gribble, 2017 (91)	Western Pacific Region	Content analysis	Australia	Scope	NA	Websites
Brewer, Vig, Crossley and Kauer, 2020 (92)	African Region, South-East Asia Region	Policy analysis	Indonesia, India, Nigeria, Viet Nam, Thailand	Scope	NA	Online retail
Changing Markets Foundation, 2017 (31)	All regions	Mixed-methods study	World	Scope	NA	Social media, sponsored blogs, mobile applications, personalised emails
Ching et al., 2021 (93)	Region of the Americas, African Region, South-East Asian Region, Western Pacific Region	Mixed-methods study	Burkina Faso, Canada, China, India, Indonesia, Kenya, Laos, Malaysia, Myanmar, Pakistan, Singapore, Philippines, United States, and Viet Nam	Scope	NA	Social media (Facebook, Instagram), online shopping portals, partner-NGO websites, online news portals, company websites, public health website blogs
Davis et al., 2020 (94)	Region of the Americas	Content analysis	United States	Scope	NA	Blogs
Department of Health Hong Kong, 2013 (95)	Western Pacific Region	Cross-sectional survey	China, Hong Kong SAR	Scope/Impact	Mothers with singleton pregnancy; Cantonese speaking, lived in Hong Kong for >1 year prior to survey	Manufacturer websites, social media, online forums, electronic ads, email messages
WHO, 2020 (40)	World	Policy analysis	World	Scope	NA	Social media (Facebook), sponsored blogs, vlogs, online magazines
Gunter et al., 2013 (96)	European Region	Content analysis	United Kingdom	Scope	NA	Manufacturer websites
Harris et al., 2017 (97)	Region of the Americas	Content analysis	United States	Scope	NA	Social media, sponsored blogs, manufacturer websites

Hastings et al., 2020 (60)	European Region, Region of the Americas, Western Pacific Region	Mixed-methods study	United Kingdom, Europe, North America, Australia, New Zealand	Scope	Industry experts and professionals with experience of marketing BMS	Mobile applications
Huang et al., 2013 (98)	Region of the Americas	Cohort study (national longitudinal study)	United States	Impact	Mothers aged 18 years or more; single births; neither mother nor infant had a health condition likely to affect feeding.	Internet
International Baby Food Action Network (IBFAN), 2018 (99)	South-East Asian Region, Western Pacific Region	Policy analysis	China, India, Indonesia, Mongolia, Philippines, Republic of Korea, Sri Lanka, Thailand	Scope	NA	Manufacturer websites, retail websites
Jaichuen et al., 2018 (100)	South-East Asian Region	Cross-sectional study	Thailand	Scope	NA	Digital TV
Lozada-Tequeanes et al., 2020 (101)	Region of the Americas	Cross-sectional study	Mexico	Scope	NA	Social media (Twitter, Facebook, YouTube)
Mak, 2016 (102)	Western Pacific Region	Mixed-methods study	China, Hong Kong SAR	Scope	Couples who had at least one child aged 3 years or younger	Blogs, social media (Facebook), parenting websites
Save the Children, 2018 (29)	World	Qualitative study	World	Scope	NA	Social media (Twitter, Facebook, Instagram), mobile messaging, sponsored blogs, mobile applications
Mejia et al., 2016 (103)	World	Content analysis	United States	Scope	NA	Social media (Facebook, Twitter), blogs
Newby et al., 2015 (104)	Western Pacific Region	Cohort study	Australia	Scope	Healthy women aged 18 years and over, first-time mothers	Retailer websites, parenting websites
Pereira-Kotze et al., 2020 (74)	African Region	Policy analysis	South Africa	Scope	NA	Social media (Facebook, Instagram)
Prado et al., 2020 (105)	Region of the Americas	Cross-sectional study	Brazil	Scope	NA	Manufacturer websites
Senkal et al., 2019 (106)	European Region	Content analysis	Europe	Scope	NA	Social media (Facebook, Instagram, Twitter), blogs, mobile applications, interactive websites
Vinje et al., 2017 (107)	South-East Asian Region	Content analysis	Cambodia, Indonesia, Myanmar, Thailand and Viet Nam	Scope	NA	Social media (Facebook posts or conversations)
Walker, 2012 (108)	World	Qualitative study	World	Scope	NA	Social media (Facebook, Twitter), mobile applications, websites

Wilking, 2020 (36)	Region of the Americas	Policy analysis	United States	Scope	NA	Social media, websites, influencers, digital display ads, banner ads, email messages, purchase reminders
Zhang et al., 2013 (109)	Region of the Americas	Cohort study (national longitudinal study)	United States	Impact	Healthy mothers with healthy term or near-term singleton infants	Websites
Zhao et al., 2019 (110)	Western Pacific Region	Content analysis	China	Scope	NA	Mobile applications

Table A2.2. Summary of included case reports

Manufacturer name and brand (Year)	Region	Country	Digital marketing technique
Nestle-Nestlac (2010) (111)	Western Pacific Region	China	Online video channel
FrieslandCampina-Friso Gold (2011) (112)	Western Pacific Region	Viet Nam	Social media (Facebook), parenting forums
Fonterra Brands Malaysia (2012) (113)	Western Pacific Region	Malaysia	Social media, sponsored blogs, website
Abbott Laboratories Philippines (2013) (114)	Western Pacific Region	Phillippines	Manufacturer website
Wyeth Nutrition-Wyeth Gold (2014) (56)	Western Pacific Region	Hong Long	Mobile applications
Danone-Nutrition (2014) (49)	Western Pacific Region	China	Internet
Nestle (2016) (115)	South-East Asian Region	India	Social media (YouTube)
Nestle-MOM & ME (2017) (116)	Western Pacific Region	Singapore	Social media (Facebook)
Nestle-NAN OPTIPRO Kid 4 (2017) (117)	Western Pacific Region	Singapore	Social media (Facebook, Instagram)
Nestle-NAN OPTIPRO 3 (2017) (118)	Western Pacific Region	Singapore	Social media (Facebook)
Nestle NAN OPTIPRO 3 (2018) (119)	Western Pacific Region	Singapore	Social media (Facebook)
Wyeth (2017) (52)	Western Pacific Region	China	Mobile applications
Danone-Nutrition (2017) (57)	South-East Asian Region	Indonesia	Social media (YouTube, Facebook, Google+, InMobi)
FrieslandCampina-Friso (2017) (53)	Western Pacific Region	Viet Nam	Mobile messaging (Zalo)
Nestle-Excella Gold (2018) (48)	Region of the Americas	Mexico	Music-streaming service (Spotify)
Abbott Nutrition Malaysia (2018) (120)	Western Pacific Region	Malaysia	Social media (Facebook)
Illuma Organic (2018) (121)	Western Pacific Region	Hong Kong	Internet (Yahoo)
FrieslandCampina-Friso (2018) (51)	South-East Asian Region	Indonesia	Social media (WhatsApp)
FrieslandCampina-Friso (2018) (50)	Western Pacific Region	Viet Nam	Social media (Facebook), e-commerce, online store
FrieslandCampina-Friso (2019) (122)	Western Pacific Region	Viet Nam	Social media (Facebook, Instagram, Zalo, Coc Coc, Bing, Google, GDN, Adtima), online store
Mead Johnson (2018) (123)	Region of the Americas	United States of America	Social media (Facebook, Instagram)
Yili-Jinlingguan (2020) (54)	Western Pacific Region	China	Artificial intelligence (use of AI to generate marketing insights)
Nestle-SuperNAN (2020) (55)	Western Pacific Region	China	Internet

Annex 3: Code compliance assessments

Title	Source	Link
Breaking the Code	Association of Breastfeeding Mothers Indonesia (AIMI)	http://www.babymilkaction.org/wp-content/uploads/2021/06/Breaking-the-Code-AIMI-Final.pdf
Marketing of infant milk in the UK: what do parents see and believe?	Swansea University for First Steps Nutrition Trust	https://static1.squarespace.com/static/59f75004f09ca48694070f3b/t/6053645514d0f3072adec94e/1616077909798/Marketing_of_infant_milk_in_the_UK-what_do_parents_see_and_believe_finala.pdf
Analysis of marketing of breast milk substitutes and the inappropriate promotion of foods and beverages to young children in the digital space in selected countries of WHO South-East Asia Region	World Health Organization Regional Office for the South East Asian Region	Unpublished report
In-country assessments of BMS companies’ compliance with the International Code of Marketing of Breast-milk Substitutes — Nigeria Report	Westat for Access to Nutrition Foundation	https://accesstonutrition.org/app/uploads/2020/02/BMS_Westat-Nigeria_Full_Report_2018.pdf
In-country assessments of BMS companies’ compliance with the International Code of Marketing of Breast-milk Substitutes — Indonesia report	Westat for Access to Nutrition Foundation	https://accesstonutrition.org/app/uploads/2020/02/BMS_Westat-Indonesia_Full_Report_2016.pdf
In-country assessments of BMS companies’ compliance with the International Code of Marketing of Breast-milk Substitutes — Thailand report	Westat for Access to Nutrition Foundation	https://accesstonutrition.org/app/uploads/2020/02/FINAL_Thailand_Report_20180204.pdf
In-country assessments of BMS companies’ compliance with the International Code of Marketing of Breast-milk Substitutes — Viet Nam report	Westat for Access to Nutrition Foundation	https://accesstonutrition.org/app/uploads/2020/02/BMS_Westat-Vietnam_Report_2016.pdf
National assessment on the compliance with the Code and the national measures – Philippines report	Westat for Access to Nutrition Foundation	https://accesstonutrition.org/app/uploads/2021/05/ATNF_Phillipines_Report_FINAL_05.04.21.pdf
Monitoreo del cumplimiento del código de comercialización de sucedáneos de la leche materna en Uruguay [Monitoring compliance with the Code of marketing of breast-milk substitutes in Uruguay]	Ministerio de Salud	https://iris.paho.org/handle/10665.2/53932
2020–2021 monitoreo al Código internacional de comercialización de sucedáneos de la leche materna. Colombia [2020–2021 monitoring report on compliance with the International code of marketing of breast-milk substitutes. Colombia].	Educar Consumadores IBFAN Colombia	https://educarconsumidores.org/wp-content/uploads/2021/05/Informe-monitoreo-al-CICSLM-Colombia-2021web.pdf
Segundo monitoreo del cumplimiento del Código internacional de Comercialización de sucedáneos de la leche materna en la República de Panamá [Second monitoring report of the International code of marketing of breast-milk substitutes in the Republic of Panama]	Ministerio de Salud, Republica de Panamá; Organización Panamericana de la Salud; Instituto de Nutrición de Centro América y Panamá	https://www.paho.org/es/eventos/2do-monitoreo-cumplimiento-codigo-internacional-sucedaneos-leche-materna-panama
La prevalencia de violaciones al Código internacional de comercialización de sucedáneos de leche materna en México [The prevalence of violations of the International code of marketing of breast-milk substitutes in Mexico]	Subsecretaría de Prevención y Promoción de la Salud	https://www.unicef.org/mexico/informes/prevalencia-de-violaciones-al-código-internacional-de-comercialización-de-sucedáneos
Estudio para estimar la prevalencia de violaciones al Código internacional de comercialización de sucedáneos de leche materna en dos ciudades de Ecuador [Study to estimate the prevalence of violations of the International code of marketing of breast-milk substitutes in two cities in Ecuador]	Ministerio de Salud Pública/ Organización Panamericana de la Salud/UNICEF	https://www.salud.gob.ec/wp-content/uploads/2019/07/3_estudio_prevalenciade_violación_CICSLM.pdf
Monitoreo al Código internacional de comercialización de sucedáneos de la leche materna en Santiago, Chile [Monitoring the International code of marketing of breast-milk substitutes in Santiago, Chile]	Departamento de Nutrición, Facultad de Medicina, Universidad de Chile.	https://www.paho.org/es/documentos/monitoreo-cumplimiento-codigo-internacional-comercializacion-sucedaneos-leche-materna
Breastfeeding and breastmilk substitute use and feeding motivations among mothers in Bandung City, Indonesia.	Helen Keller International	https://doi.org/10.1111/mcn.13189
Survey on the implementation of Sri Lanka for the promotion, protection and support of breastfeeding using WHO NetCode periodic assessment tool	Health Systems Research Unit Department of Community Medicine Faculty of Medicine University of Colombo Sri Lanka	Unpublished report

