

Review

Monitoring food and non-alcoholic beverage promotions to children

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Summary

Food and non-alcoholic beverage marketing is recognized as an important factor influencing food choices related to non-communicable diseases. The monitoring of populations' exposure to food and non-alcoholic beverage promotions, and the content of these promotions, is necessary to generate evidence to understand the extent of the problem, and to determine appropriate and effective policy responses. A review of studies measuring the nature and extent of exposure to food promotions was conducted to identify approaches to monitoring food promotions via dominant media platforms. A step-wise approach, comprising 'minimal', 'expanded' and 'optimal' monitoring activities, was designed. This approach can be used to assess the frequency and level of exposure of population groups (especially children) to food promotions, the persuasive power of techniques used in promotional communications (power of promotions) and the nutritional composition of promoted food products. Detailed procedures for data sampling, data collection and data analysis for a range of media types are presented, as well as quantifiable measurement indicators for assessing exposure to and power of food and non-alcoholic beverage promotions. The proposed framework supports the development of a consistent system for monitoring food and non-alcoholic beverage promotions for comparison between countries and over time.

Keywords: Food promotion, INFORMAS, monitoring, sugar-sweetened beverages.

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Background

There is a large body of research to support an association between the marketing of unhealthy foods and non-alcoholic beverages to children and childhood obesity (1–7). A systematic review commissioned by the World Health Organization (WHO) in 2008 found strong evidence that marketing influenced food purchases (1). Evidence also indicated that food marketing has a modest impact on children's food knowledge, preferences and consumption, with implications for weight gain (1). The magnitude of effect of food marketing on body weight is estimated to be at least the same as that of other determinants of obesity, including family, peers and socioeconomic status (1); and food marketing is amenable to intervention, making it a promising lever for change. Sugar-sweetened breakfast cereals, soft drinks, confectionery and high fat snacks are the products most frequently advertised to children internationally on television (1).

The term 'marketing' refers to commercial activities designed to increase brand recognition, appeal and ultimately purchase of products and services (8). It traditionally relates to four broad classes of activities, including 'product', 'price', 'place' and 'promotion' (9). In this review, we refer only to food (which includes non-alcoholic beverages) promotion, which encompasses advertising, publicity and some sales promotions.

Reducing children's exposure to the promotion of unhealthy foods and non-alcoholic beverages, and the persuasive power of these promotions, has been recognized as a target for childhood obesity prevention policy and research. Unhealthy products include those that are high in saturated fats, *trans*-fat, free sugars or salt (10). WHO has released a set of recommendations to guide Member States in developing policies on food and non-alcoholic beverage promotion to children (11). This includes establishing systems for monitoring and evaluating the implementation of the recommendations to ensure policy objectives are being achieved (11).

Monitoring of food promotions is necessary for: (i) identifying the extent of exposure and the persuasive power of promotions; (ii) informing policy specifications, including the types of media and promotional techniques to be targeted; and (iii) evaluating the success or failure of policy interventions on reducing children's exposure to promotions. Elements of promotions that influence their effectiveness include: the extent of *exposure* to the message, including the number of people reached and the frequency of contact; and the persuasive *power* of communications, related to the message design and content (8). Monitoring activities and policy responses should consider both of these elements.

The International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action

Support (INFORMAS) is a global network of public-interest organizations and researchers that aims to monitor, benchmark and support public and private sector's actions to create healthy food environments and reduce obesity and non-communicable diseases (NCDs) and their related inequalities (12). This paper introduces the INFORMAS module relating to the monitoring and benchmarking of unhealthy food promotion. The module as a whole aims to address the research question, 'What is the exposure and power of promotion of unhealthy food to different population groups?', and this paper focuses specifically on monitoring unhealthy food promotion to children. It presents a proposed approach to guide the systematic collection of information on food promotions to children for comparison between jurisdictions and over time. In the future, approaches for monitoring food promotion to other population groups, such as adults, may also be developed.

Review of previous monitoring of food promotions

Studies describing exposure to food promotions are extensive. The most recent literature review, including publications up to 2008, identified 115 studies on this topic (1). We present a narrative review of key papers, conducted in June 2012, to illustrate and appraise methods used for monitoring food promotions across a range of media (Supporting Information Table S1). Scientific databases searched included Medline and Embase. Search terms were ('food' or 'beverage') and ('advertising' or 'marketing' or 'promotion') and ('television' or 'magazines' or 'internet' or 'sponsorship' or 'outdoor' or 'point-of-sale' or 'social media' or 'SMS' or 'radio'). Included papers were those that collected data on exposure to and/or power of food promotions. Selected papers were those that collected relatively larger data samples, and, where possible, collected data from multiple jurisdictions or time points to indicate the transferability and stability of the measures over areas and time. Papers illustrating a range of sampling and data collection methods were selected. Studies measuring adults' exposure to promotions were included, as these are methodologically similar to approaches focusing on children. Excluded papers were those that only assessed the effect of promotions on children or the food promotion policy environment. The review was limited to English language publications. For each study, the following was reported: media platform assessed, monitoring approach used, promotion element assessed (exposure and/or power), system for defining products as healthy and unhealthy, and target audience.

Sampling methods

Sampling relates to the identification of the media segment to be assessed, including the channels, locations and sites.

These have been selected based on their popularity with, and reach to, the target group. For television, methods to identify popular channels and/or programmes included the purchase of commercial audience data (13–15); or the inclusion of age- or race-targeted channels/programmes (16,17). Audience viewing data indicate that children's television viewing is *not* confined to designated children's programmes (18). Surveys of children have been used to identify popular programmes, including the use of 1-week television viewing diaries with concurrent recording of all channels (19). This latter method entails the recording of large amounts of unutilized less popular broadcasting. Alternatively, child surveys could be used to identify the most popular channels watched. Channels selected represent national or local networks, although some studies have included broadcasting from neighbouring countries (14).

Length of time for television monitoring was 4 (20) to 24 d (21). This included consecutive days, usually weekdays and weekend days, or alternatively, single days over weeks or months. Other studies have used yearly audience data for spot advertisements (lists of advertisements and their ratings) to capture exposure to advertisements across all programmes and across years (15). Generally, holiday periods and special events were excluded to provide a sample that was representative of usual advertising patterns (18,22). The length of daily recording varied: 'prime-time' (approximately 19:00 to 22:00) (23), Saturday mornings (16) or major broadcast periods (e.g. 6:00 to 22:00) (18,24). Data only for specific time periods limits analyses of overall advertising patterns and representativeness of data. However, collecting data over major broadcast periods captures advertisements that have lower population reach. Advertisements can be weighted or multiplied by audience number to give an estimate of advertisement reach (13), or cumulative population frequency or duration of exposure to advertisements (25). The UK broadcasting regulator developed the term 'advertising impacts' to refer to the number of people viewing an advertisement, where one impact is equivalent to one person viewing one showing of an advertisement (26). Audience data can also identify broadcast periods when the largest number of the target audience is watching to compare advertising during peak and non-peak times (18,21). Peak times have been defined as when greater than 25% of the child audience was watching television.

Commercial data on media reach are available for the internet. Net ratings data can identify usage of websites, including food company-owned and third-party websites (27,28). Studies have also used industry reports to identify prominent food brands, and search engines to identify related brand websites (29). Net ratings data indicate that many food company-owned websites do not have wide population reach, and exposure to food promotions

on third-party websites may be more important (27). However, some food company-owned sites contain large numbers of branded games (27), potentially leading to greater time spent on these sites per visit. Typically, each website is monitored on one occasion within a defined period. Social networking sites, such as Facebook and YouTube, are increasingly popular (30) and result in greater interaction online (31). Despite this, these types of internet communities have been relatively unstudied by the health sector. Similarly, no systematic monitoring data are available on other new media, such as mobile phone messaging.

Readership data for magazines can be useful for identifying popular titles. This is preferable to selecting titles that are targeted to a certain age or gender demographic, for which the magazines' reach are unknown. Studies have typically collected all editions of titles published within 1 year (32,33). For assessing point-of-sale promotions, including promotions on packaging and advertising within stores, food stores have been sampled using business listings to identify all stores within designated areas (34) or, alternatively, researchers have selected one or more major supermarket chains (35,36). For packaging promotions, assessment included all products featuring promotional characters (36) or cross-promotions (35), or only those brands/products that were known to dominate promotions on other media (34,37).

Studies assessing outdoor advertising have sampled all areas along bus routes and around shops within one city (38), or within defined radii of institutions/facilities serving the target group (39). To assess sport sponsorship, researchers have identified popular sports and then selected related sports clubs/organizations (40,41). For sponsorship in schools, representative samples of schools have been selected from one region (42) or nationally (43).

Data source/collection methods

For television monitoring, two methods have been used for data collection. Firstly, commercial media data can be purchased (25,44). The format of these data varies, although it is usually pre-coded using industry classifications for product type and food category. Video files of advertisements may be provided, enabling advertisements to be verified, recoded and assessed for persuasive techniques. However, commercial data may be prohibitively costly to purchase. Alternatively, data can be collected manually by recording live television. While this has obvious technical complexity, including the need for recording devices and hard disk space, in addition to personnel requirements to view and code advertisements, this approach can be less costly and, potentially, results in a richer and more applicable data set.

Internet data can be captured by downloading the content of web pages using specialized software (29). Magazines data can be obtained prospectively, by collecting editions as they are published, which requires greater time for data collection; or by identifying back copies, which may be harder to locate. On-pack promotions have been recorded in-store on a single occasion (34,36), or products are purchased and compared across time (35). Within stores, the placement and/or prominence of in-store advertising has been assessed (45,46). Data on sponsorship have been identified from surveys with sport or school officials (40,42,43) or by assessing organizations' websites (41,47). Outdoor advertisements have been observed and either recorded manually, or using digital cameras and geo-positioning systems (38,39).

Food classification systems

Systems for classifying the nutritional quality of promoted foods and beverages include nutrient profiling models that assign numerical values to nutrients as part of a scoring system, including for negative nutrients (e.g. saturated fat, sugar and sodium) and positive components (e.g. fruit, vegetables, nuts, fibre and protein). One such profiling system was developed by the UK Food Standards Agency to underpin regulations restricting food and non-alcoholic beverage advertising on television (48). This model has been used in monitoring studies for television in New Zealand (49), and for television (25) and outdoor advertising (38) in the UK, where difficulty was reported in obtaining nutritional information that was not mandated for inclusion on food labels (49). A similar system was used in Australia to classify on-pack promotions (36). While nutrient profiling is useful from a policy perspective to quantify the nutritional merit of foods and beverages, calculations require detailed nutritional information and ingredient lists, or nutrient composition databases with current information on market brands. As such, information is unlikely to be available in many jurisdictions, and this method may not be suitable for monitoring activities in many countries.

Most studies have applied a food-based system for classifying products. Foods and beverages are usually grouped according to nutrition guidelines, and foods are often categorised according to major food categories of healthy/core and unhealthy/non-core items and subgroups: fast food, sweets, dairy, cereals, chips/crackers, beverages, fruits/vegetables and other (16,18,21,44). Culturally specific foods have also been included (17). The presence of government endorsement symbols on food labels has been used to categorize products as healthful (17), along with the use of criteria for food and beverages sold within schools (15).

Monitoring power of promotions

Television advertising has been assessed for the presence of promotional characters (e.g. cartoon figures and celebrities) (14), premium offers (e.g. competitions) (19,50), and health and nutrition claims (51,52). Other studies have classified emotional appeal, and audio and visual elements within advertisements to determine their primary audience and interest; or other aspects, such as promoting overconsumption (53). The frequency of advertisements containing promotional techniques has been compared across children's peak and non-peak viewing times based on audience data, and for healthy and unhealthy foods (54). Detailed instruments for collecting data on online promotions are available (27,29). These collect information on: interactive components; links to events, sites and promotions; 'children only' sections; incentives and downloadable items; and promotional characters. For food packaging, features assessed include promotional characters, competitions and nutrition claims (34–36).

Monitoring frameworks

Frameworks exist for monitoring food promotions. These include the WHO Framework for Implementing the Set of Recommendations on the Marketing of Foods and Non-Alcoholic Beverages to Children (8). This provides detailed guidance on a range of activities to be monitored, including promotion exposure and power. Consumers International have also produced a framework for monitoring food promotion to children (55). This outlines a stepwise approach: basic/core monitoring to establish whether the problem of unhealthy food promotions exists or not; expanded monitoring, collecting larger samples across multiple media; and advanced monitoring, collecting data samples at multiple time points for different subgroups. These frameworks provide suggestions for sampling of media; using case studies of individual companies (8,55); and for recording advertisements and conducting content analyses (55).

Limitations of previous monitoring research

Research on the content and extent of exposure to food promotions relates mainly to television advertising. However, it is acknowledged that food promotions span a range of media (3), including emerging media platforms and common forms of broadcast media (e.g. radio) which are relatively unstudied, but are likely to be important in terms of exposure and power. Most of the evidence comes from high-income English-speaking countries, specifically Australia, New Zealand, the UK and USA. Studies that have been conducted in low-/middle-income countries demonstrate similar levels of unhealthy food promotions to those in high-income countries (56,57).

Approach to monitoring food promotions

Assessment of contextual factors and policy environment

When assessing the need to monitor food promotions and the level of data to be collected, investigators should firstly consider country-specific contextual factors related to capacity and resources, and likely influence of promotions on nutrition and disease outcomes. Initial questions include: What kinds of media are prevalent?; What kinds of media do children most frequently access and when?; Is there any existing evidence about children's exposure to unhealthy food promotions?; What is the within-country expertise in collecting and analysing data on food promotions?; What are the resources available to undertake a monitoring programme?; and, What is the policy environment related to food promotions?

Where related industry codes of practice and/or government regulations exist, these should be assessed for their scope, content and potential loopholes, and can be benchmarked against international recommendations for food promotion regulations (11,58,59). Aspects of policies to be assessed include: the method for classifying products as healthy or less healthy/unhealthy; age groups covered; media, promotional techniques and settings included/exempted; and disincentives for non-compliance (58). Ideally, policies should be based on independently developed and government-approved criteria for classifying food; cover all children and adolescents; cover all media types, promotional techniques and settings where children gather; and be monitored and enforced (58).

Stepwise monitoring

Based on the monitoring approach outlined by Consumers International (55), we propose a stepwise framework comprising three tiers for identifying the media platforms, promotion element and demographic groups to be assessed, and the time periods/points for data collection. This framework is outlined in Table 1, and includes monitoring activities that are part of the 'minimal', 'expanded' and 'optimal' approaches.

The 'minimal' approach involves the measurement of children's exposure to promotions for one dominant medium for a limited number of time points. The focus should be on younger children (less than 12 years) as they are less able to distinguish between commercial and non-commercial content, making them more vulnerable to promotions (60,61). The 'expanded' approach seeks to assess younger and older children's exposure to promotions across several dominant media over more time points. The age of a 'child' varies between studies and in regulatory frameworks (62). The definition of a child should be based

on the age defined by applicable national child-directed statutory regulations. Where this is unclear, the definition provided in the United Nations Convention on the Rights of the Child may be adopted (<18 years) (63). In both the 'minimal' and 'expanded' approach, the power of promotions would be measured for a limited number of persuasive techniques (e.g. presence of promotional characters and premium offers).

In the 'optimal' approach, measures of both extent of exposure and power of promotions across all dominant media should be collected for a range of time points. A more thorough evaluation of the content of promotions and persuasive techniques would be conducted. Exposure to, and appeal of, promotions to a range of age and ethnic groups should be determined. In all approaches, findings should be compared to existing national policies on food promotion to children to evaluate the degree of implementation and the extent that these are effective in reducing the impact of food promotions on children, and also compared to international benchmarks.

Dominant media platforms may vary between countries and the choice of media to monitor should be chosen based on the characteristics of media use. For example, in countries where many households do not possess televisions or computers, outdoor advertisements or radio may be more important. To identify the most dominant media, data on industry marketing expenditure can be used, where available. However, these data may be misleading as some media promotions can be relatively inexpensive, such as internet promotions. Other sources of information include regional promotion publications, which identify emerging trends, and discussions with experts in the field.

This framework is underpinned by a set of guiding principles which assist in directing monitoring to ensure policy-relevance. Firstly, monitoring should assess the overall extent of exposure to promotions. While the monitoring of compliance with voluntary codes is important to demonstrate the extent of implementation, industry codes are typically narrow in scope (64), and compliance does not necessarily indicate low exposure. Secondly, monitoring should involve the systematic assessment of all promotions within the sampled media. This includes identifying the promotion of healthy products to understand the overall promotional environment. In contrast, a case study approach only permits assessment of a narrow range of companies, broadcast times, locations or materials. Thirdly, specific indicators should be used to measure trends over time (refer to Table 2). For example, for television advertising, the number of advertisements per hour should be determined rather than the proportion of advertisements for food/food groups, given that the magnitude of exposure to promotions is the element being measured. The use of proportions can be misleading if the number of promotions is small.

Table 1 Stepwise framework for monitoring food and non-alcoholic beverage promotions to children

'Minimal' approach	'Expanded' approach	'Optimal' approach
Media type and promotional aspect assessed		
Measures of <i>exposure</i> to one dominant form of promotion (e.g. television). Measures of <i>power</i> focusing on a limited number of promotional techniques (e.g. promotional characters; premiums; or nutrition and health claims).	Measures of <i>exposure</i> to a larger number of dominant media/channels (e.g. television and other dominant media). Measures of <i>power</i> focusing on a limited number of promotional techniques (e.g. promotional characters; premiums; or nutrition and health claims).	Measures of <i>exposure</i> to promotions on all major media. Measures of <i>power</i> across multiple promotional techniques. Content analyses of promotions to identify the content, aims and themes embedded in the messages.
Time/site sampling		
Collect data for the most representative time periods/locations/sites on selected occasions.	Collect data for representative time periods/locations/sites on an increased number of occasions/seasons/weekdays.	Collect data at multiple representative time periods/locations/sites across a broad range of occasions/seasons/weekdays/school and non-school days.
Target demographic group		
Focus on younger children's (aged less than 12 years old) exposure (e.g. popular children's or family television programming or children's settings).	Focus on younger and older children's exposure (e.g. popular children's or family television programming, or children's settings).	Focus on younger and older children, and racial and ethnic groups' exposure.
Food classification		
Use standardized approach to food product classification based on dietary guidelines and particularly distinguishing energy-dense, nutrient-poor foods (non-core foods) and nutritious foods.	Use standardized approach to food product classification based on dietary guidelines and particularly distinguishing energy-dense, nutrient-poor foods (non-core foods) and nutritious foods.	Use standardized approach to food product classification based on dietary guidelines and particularly distinguishing energy-dense, nutrient-poor foods (non-core foods) and nutritious foods. Also compare with local policy-relevant food classification such as already-existing classification for health claims regulations, school food policies etc.
Analyses		
Analyses of patterns of healthful/unhealthful food and non-alcoholic beverage promotions overall and for specific time periods/locations/sites. Comparison of patterns of promotions to existing policies on food marketing, including products promoted, time periods/channels/sites/locations where promotions are identified and the persuasive techniques used in promotions.		

Specific methods for monitoring food promotions to children

Undertaking research on food promotions follows the same processes typical of most quantitative health research, that is: (i) identifying the population of interest (sampling frame); (ii) selecting a representative study population (sampling); (iii) systematically collecting data to describe the study population; (iv) data analysis and interpretation; and (v) research dissemination (65). The 'population' in this instance refers to the media platform being assessed. Recommendations for defining the sampling frame, sampling methods, data collection and food types are provided in Table 2.

Defining the sampling frame and data sampling

After the dominant media platform has been identified, the sampling frame should be established. This involves

determining popular channels, stations, sites, locations or publications for the target group. These can be identified using commercial audience/ratings/readership data, or through small surveys with the target group. Data should seek to determine any regional variation in media use, such as exposures to local channels or specific language channels/magazines.

Data collection

Methods for data collection vary depending on available resources. For some media, commercial data can be purchased to describe the number and type of products being promoted. For internet promotions, commercial data usually focus on third-party websites as promotions on company-owned sites are not typically considered as 'advertising' by data providers. Alternatively, manual recording of data can be used, including: recording television and radio broadcasting, scanning websites and magazines,

Table 2 Proposed approach to monitoring food and non-alcoholic beverage promotions to children

Media platform*	Sampling/time period	Data collection	Measurement indicators
Television (TV)	Identify popular channels (e.g. top five channels) with the target group, based on audience or ratings data. Alternatively, survey data may be used to indicate channels most watched by the group (e.g. small surveys of children in schools). A range of national, local or cable channels may be selected. Channels may be terrestrial or satellite broadcasts; national or local networks. Language-specific channels can also be sampled. Select a representative broadcast period by excluding special events and holiday periods. Sample a minimum of 4 days (2 weekdays and 2 weekend days), including the major broadcast period (at least 7:00–21:00 daily). These days may be consecutive or may comprise single days sampled over weeks or months.	Data can be collected by purchasing commercial advertising data. For each ad broadcast during the sampled period, details should be provided on brand and products, channel, time shown, nature of the product (food, non-food), food type. Ideally, video files of ads should be provided to enable validation of data and for further food coding and/or content analyses. Alternatively, data can be recorded at the time of broadcast. Data may be recorded using a personal video recorder (PVR) or by using Windows Media Centre together with a TV tuner to record live TV.	Rate of overall ads (ads h ⁻¹) Rate of food vs. non-food ads (for the major broadcast period and/or peak viewing times/programmes); Rate of unhealthy food ads vs. healthy food ads (for the major broadcast period and/or peak viewing times/programmes); Rate of ads for food groups and indicator foods (for the major broadcast period and/or peak viewing times/programmes); Rate of food ads with persuasive promotional techniques.
Internet	Identify popular websites with the target group, based on net ratings data. In the absence of this data, small surveys can be conducted with a sample of the target group to provide an indicator of popular websites. Include both food and non-food websites. Each site should be visited once within a defined time period.	Data can be collected by purchasing commercial advertising data (available for third-party websites only). Alternatively, ad data can be coded at the time of the site visit or the webpage can be captured using specialized software for later coding (food company-owned and third-party sites).	Frequency of overall ads; Frequency of food vs. non-food ads; Frequency of unhealthy food ads vs. healthy food ads; Frequency of ads for food groups and indicator foods; Types of promotional techniques used (e.g. kid's section, games, premium offer).
Magazines	Identify popular magazine titles with the target group based on readership data or small surveys to determine popular magazines. Include at least 6 months of publications for each magazine title.	Data can be collected by purchasing commercial advertising data. Alternatively, data can be collected by scanning magazines for ads. Magazines can be collected prospectively or by obtaining back copies.	Frequency of overall ads; Frequency of food vs. non-food ads; Frequency of unhealthy food ads vs. healthy food ads; Frequency of ads for food groups and indicator foods; Types of promotion (e.g. direct ad, in editorial material, games); Print space for food and unhealthy food ads (% of page, % of magazines).
Outdoor advertising	Randomly sample locations that are frequented by the target group (e.g. schools, community facilities). These may be identified using online directories or commercial data. Include the area within 500 m of facilities.	Record ads using a digital camera and global positioning system. Alternatively, ads can be coded during field visit to facilities. Radii around facilities should be scanned by walking/driving along all sampled areas/streets.	Rate (and size) of overall ads within 250 m and 500 m from facilities; Rate (and size) of food vs. non-food ads within 250 m and 500 m from facilities; Rate (and size) of unhealthy food ads vs. healthy food ads within 250 m and 500 m from facilities; Rate (and size) of ads for food groups and indicator foods within 250 m and 500 m from facilities.
Product packaging	Either (i) identify major supermarket chains in the country/region (those that have a majority of market share); or (ii) randomly sample outlets selling foods and non-alcoholic drinks in a defined geographical region. All food products that contain selected promotional techniques on packing should be assessed. Alternatively, a range of indicator food groups can be selected based on those known to dominate food promotions on other media.	Record promotions on packaging in-store during field visits to supermarkets / outlets selling foods and non-alcoholic drinks. This may include the presence of promotional characters, premium offers and/or nutrition and health claims.	Frequency of overall food products with promotions on packaging; Frequency of unhealthy food ads vs. healthy food products with promotions on packaging; Frequency of products within different food groups with promotions on packaging; Types of promotions present on packaging.
Sponsorship	For sport, identify the most popular sports for the target group and randomly sample clubs or sporting organisations for these sports within a defined area. Only include clubs attended by the target group. For schools, randomly sample schools from a defined area. Select primary and/or secondary schools based on the target group's age range. For other public events that are of appeal to or attended by children, identify a representative sample of events held within a defined area and over a limited time frame (e.g. 6 months). These may be identified through local publications/ promotions.	Surveys should be conducted with sport or school officials, or event organizers to assess number and type of sponsors. For organizations with websites (e.g. larger sporting bodies and events), sponsorship data may be obtained by scanning websites.	Frequency and rate (sponsors/organization) of overall sponsors; Frequency and rate (sponsors/organization) of food vs. non-food sponsors; Frequency and rate (sponsors/organization) of unhealthy food sponsors vs. healthy food sponsors; Frequency and rate (sponsors/organization) of sponsors for food groups; Types of sponsorship arrangements (e.g. logos on children's uniforms, vouchers for products as rewards).

*Other media platforms include new media (e.g. social networking sites and mobile phone messaging) and radio, although there is little information available to guide data collection.

field observations of outdoor advertisements and point-of-purchase promotions, and surveys of organizations to determine sponsorship arrangements.

For each advertisement identified, information should be collected on: brand/product name; company; channel, location or publication name; nature of the product (food/beverage, non-food); and description of the food product. The time of broadcast for television and radio advertisements, and the size of outdoor advertisements and magazine promotions can be recorded.

Analyses of the content of the promotions can be conducted: quantitatively, including measuring the presence of promotional characters, premiums, or visual and audio elements; and/or qualitatively, by assessing promotions' themes and emotional appeals. Existing or new tools used to assess promotions' power should be tested for interrater reliability, as these could be differentially interpreted.

Food classification

A food-based system for classifying products is recommended, whereby foods and beverages are classified as either healthy or unhealthy. Where available, nutrition data can be used to establish nutrient cut-off points or to allocate products to major food groups. This nutrient information could be determined through data collection as part of the INFORMAS module for monitoring the composition of foods and beverages (66). Region-specific foods should be considered. Ideally, criteria should be based on dietary guidelines and other relevant local policy documents, such as requirements for foods sold within schools. Discrepancies can then be identified between the 'advertised diet' and dietary goals.

A small number of regional and international frameworks are available for classifying food as healthy or unhealthy. For example, the Pan American Health Organization recommends that only 'whole' foods (e.g. fruits, vegetables and whole grains) and products that contain at least 50% by weight of whole foods should be marketed to children (67). Specifications are also made for content of sugar, saturated fats, sodium and the exclusion of industrially produced *trans*-fat.

Measurement indicators

Exposure data can be compared between locations, over time and between companies by using measurement indicators, including the frequency of promotions per hour/site/location. Indicators can be determined for the total sample and for selected time periods/locations, such as during peak viewing times for television. Peak viewing times have been defined as periods when more than 25% of the potential target audience is watching (18), although

audience data should be assessed to ensure this cut-point is appropriate for individual countries. Refer to Table 2 for more details.

Implementation considerations

Other considerations for data collection include the need for piloting data collection tools and protocols to ensure these are relevant to the local context and, where several investigators are involved, that interrater reliability is high. Reliability can be assessed by recoding samples using different coders and comparing coding consistency. Where commercial data are purchased, these should be validated against a sample of manually collected data. To compare changes in promotions over time, measures should be repeated regularly. Repetition of data collection could be linked to policy action in the country, such as the introduction of industry self-regulations or government regulation. Often it is not feasible to collect national-level data; instead, local data from one or more regions within a country can be used. Consideration should be given to any differences in regional areas that may affect advertising patterns (e.g. demography or population density). As seasonal advertising patterns exist (21), data should be collected at similar time points each year. Information on contextual factors, such as economic influences, should be considered in relation to any changes in promotional patterns detected.

The sharing of data over time, proposed as part of the INFORMAS project, will allow regional and international comparisons of food promotions, and the ability to benchmark countries' performance in this area. Data sharing will have additional benefits, including the availability of data on cross-border media, such as websites and satellite television. It may be possible to develop a representation of the promotional opportunities that transnational companies are engaging in globally, and to compare companies' promotions across countries.

The proposed monitoring framework allows for flexibility at the local level, depending on available resources and perceived priorities. Additional investigator time and funding is required for each media type, promotional technique and demographic group assessed. The cost and labour differences in the use of commercial data on food promotions compared to manually collected data should also be considered. Based on the authors' experience in undertaking monitoring of food promotions across high and low-/middle-income countries and for different media, the level of resources required to undertake the proposed 'minimal' approach is relatively low, where these data are collected manually rather than purchased through commercial sources. Inputs mostly relate to researcher time in capturing and coding data. Skills required for these tasks can usually be met by a graduate-level researcher.

Overlap with other INFORMAS modules

By definition, marketing also refers to the nature of the product; its price; and place, including locations/outlets where products can be purchased and product placement within outlets. Approaches for monitoring these aspects of marketing are outlined in INFORMAS modules related to food composition (66), food prices (68), food retail (69) and food provision (70).

Conclusion

The proposed monitoring framework provides a recommended approach for data sampling and collection, classification of foods, and assessment of promotional techniques. This framework supports the development of a consistent system for monitoring food promotions nationally, regionally and globally, and to evaluate the success or failure of policy interventions or advocacy activities to reduce the prevalence of unhealthy food promotions over time. Monitoring is necessary for understanding the scope of the problem, and for promoting and guiding the development of meaningful policy interventions. The next step in implementing the proposed framework involves development of data collection tools that are suited to individual countries or regions.

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Conflicts of interest

Bruce Neal is the Chair of the Australian Division of World Action on Salt and Health (2007–ongoing), was a Member of the Pepsico Global Scientific Advisory Board (2010–2012), was the Independent Adjudicator for the Australian Responsible Marketing to Children's Initiative (2009–2010) and holds funding from the Australian Food and Grocery Council as part of a National Health and Medical Research Council of Australia Partnership project (2010–2014). The other authors declare that they have no competing interests.

Supporting information

Additional Supporting Information may be found in the online version of this article, <http://dx.doi.org/10.1111/obr.12076>

Table S1. Indicative selection of key research studies on food and non-alcoholic beverage promotions for different media and population groups.

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