FOOD ENVIRONMENT ASSESSMENT

Food and Beverage Promotion Tool

Overview

The Food and Beverage Promotion Tool is used to gather data on the extent and nature of food advertisements[1] in food retail settings and outside, along roadsides. In addition to collecting data on the location of food advertisements and types of foods advertised, the tool assesses other promotional characteristics that may determine the persuasive power of advertisements to influence food preferences and choices of consumers, including marketing strategies employed, discounts, or child-targeted imagery. Depending on study design, the tool can enable:

1. Identification of food advertisement hotspots—i.e., areas where advertisements are more densely placed, which may be of particular interest if hotpots overlap with areas frequented by nutritionally vulnerable target populations;
2. Comparisons of the extent (prevalence) and nature (content and promotional character) of food advertisements between different types of neighborhoods (e.g., by urbanicity or socio-economic makeup); and
3. Exploration of possible links with food purchasing and diet outcomes

The tool can be adapted to capture both indoor and outdoor food and beverage promotion. For indoor promotion, it is recommended to integrate the tool as an additional module of the In-Depth Vendor Assessment Tool (for Availability or Costs and Affordability), so that data can be gathered on both food advertisement and food availability and prices at the same time. For outdoor promotion, it is recommended to integrate this tool as an additional module within the Community and Market Mapping Tool. This will enable enumerators to scan a given study area and gather data on food outlets and advertisements at the same time.

The approach is adapted from The Food Environment Toolbox[2] and the International Network for Food and Obesity/Non-communicable Diseases (NCDs) Research, Monitoring and Action Support (INFORMAS) Protocol for Measuring Outdoor Advertising in School Zones[3] (Downs, Staromiejska, et al., 2024; Mackay et al., 2017).

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[1] Food advertising is defined by the World Health Organization as a form of marketing that includes commercial communication or messaging intended to increase recognition, appeal, and/or consumption of food or non-alcoholic beverage products or services. It may utilize print media, broadcast media (television and radio), and may take place online or in outdoor spaces (billboards and posters). Marketing is a broader term, which in addition to advertising, includes product placement, sponsorship, product design and packaging, among others (World Health Organization, 2012).

[2] The Food Environment Toolbox encompasses a suite of assessments designed to measure different dimensions of the food environment in LMICs. The toolbox is available through the Rutgers University website (https://sites.rutgers.edu/food-environment-Toolbox/), and was funded through the Innovative Methods and Metrics for Agriculture and Nutrition Action (IMMANA) program.

[3] INFORMAS (International Network for Food and Obesity / Non-communicable Diseases (NCDs) Research, Monitoring and Action Support) is a global network of public-interest organizations and researchers that aims to monitor, benchmark and support public and private sector actions to increase healthy food environments and reduce obesity and NCDs and their related inequalities (https://www.informas.org/about-informas/). The network has been active since 2012 and has developed a suite of protocols for monitoring food environments, which have primarily been implemented in high-income countries, but also some LMICs.

Rationale

Food advertising is widespread in urban areas of low-and-middle income countries (LMICs). Advertisement is often concentrated in areas of high population density or traffic. Studies have reported higher density of advertisement around schools and in lower-income neighborhoods, compared to high-income areas (Amevinya et al., 2022; Barquera et al., 2018; Karugu et al., 2024; Kelly et al., 2015). Unhealthy foods and beverages that are high in saturated fatty acids, trans-fatty acids, free sugars and/or salt constitute the bulk of all food marketing globally (World Health Organization, 2022). In urban areas of LMICs, food companies may seek to generate interest in UPFs and fast food as 'modern' or convenient products that are part of sophisticated, busy lifestyles (Cleary et al., 2022; Cockx et al., 2018; Kenney et al., 2024). Some countries have begun to restrict advertising of unhealthy foods to children, including around schools (Taillie et al., 2019; World Health Organization, 2021). Greater evidence on the extent, nature, and impact of food advertising can inform the design of these policies and monitor the effects of their implementation.

The Food and Beverage Promotion Tool uses observation-based methods of data collection, where enumerators locate and record select features of food advertisements that consumers are potentially exposed to. To capture consumers' actual exposure to advertisement, alternative methods of real-time data collection, such as recruiting study participants to contribute images or videos of their surroundings, or wear cameras as they navigate their normal food environments, may be more suitable. However, these methods typically require significant training and resources. To date, measurement of potential exposure has been much more common, while actual exposure has been limited to studies of online marketing in which participants provide media usage data (Kelly et al., 2023), Self-reported exposure to food advertisement is also possible, but subject to recall bias and not recommended with children.

Food promotion also takes place via television, radio, and increasingly, through digital media, as internet and social media advertisement expands. While many studies to assess exposure have focused on television and traditional print media (Kelly et al., 2019), methods to assess digital advertising are still emerging.

Type of data

Food advertisement location can be measured using geospatial data, and complemented with information about the content of the advertisements, including: the type of food promoted; brand name; type of advertisement (e.g. billboard, sign, branded furniture); discounts or other incentives offered; health claims made, and whether advertisements are targeted to children (e.g. featuring cartoons or other images to appeal to children). Photographs of the promotions or advertisements are typically collected as well. In some cases, enumerators may gather only the location and take photographs of the advertisements; then, post-data collection, analysts can use the photographs to code content.

Some data collection tools specifically target "branded" food advertising, and the WHO definition of marketing focuses on communication and messaging for commercial purposes (Kelly et al., 2013; World Health Organization, 2012). However, depending on research objectives, there may also be interest in monitoring promotion and messaging of non-branded, unpackaged foods, including fresh foods that contribute to a healthy diet (e.g., in the context of a nutrition or healthy eating communication strategy that utilizes posters or other printed media). Questionnaires can be tools easily be adjusted to capture such foods if this is the case. Similarly, while tools often focus on non-alcoholic beverages, if promotion of alcohol in a certain context is of concern, questionnaires can also be adapted to include these products in their food lists.

Indicators

Most metrics for food promotion are density-based, as in the count of food advertisements per a specified geographic area (e.g. per 100 square meters). Geographic areas can be defined as the total area of a study cluster (e.g. neighborhood, census tract, administrative zone), the area around certain landmarks (e.g. schools or other institutions), areas along a main road or street, or areas within a specified distance of study participants. Each of these metrics should be compared across different types of contexts in the assessment area, including neighborhoods with different socioeconomic status, informal settlements or urban slums. Comparisons may also be made between public and private school food environments.

Data from the Food and Beverage Promotion Tool can be used to generate indicators like the following, which is a non-exhaustive list:

Density of healthy versus unhealthy food advertisements	In addition to measuring the density of all food advertisements, investigators may wish to compare the density of healthy versus unhealthy food advertisements. This requires classification of foods as healthy or unhealthy, which can be challenging. In some cases, it may be possible to categorize foods according to Food-Based Dietary Guidelines (FBDG) food groups, but many processed foods include multiple ingredients, some of which may be healthy and some unhealthy. More complex methods of classification such as nutrient profiling have been used to deal with this problem, but this requires detailed food composition data. There is no globally standardized approach. See box below on food classification.
Density of unhealthy food advertisements targeted to children	Food advertisements targeted to children can be identified based on a variety of factors, including the presence of cartoon characters that are company-owned or from movies or television or celebrity endorsements, through tie-ins between the product advertised and television or movies for children, or inclusion of games, among others (World Health Organization, 2022). Many countries have put in place bans on the use of such images or techniques to elicit the interest of children and the WHO has issued a guideline to promote policies that protect children from the harmful impact of food marketing.
Density of food advertisements with a discount or other promotional offer	Companies may enhance their marketing power by offering discounts or other promotional offers (e.g. buy 1 get 1 free) that enhance the appeal and affordability or their products.

Classification of foods into healthy and unhealthy groups:

Deciding how to categorize individual foods into food groups, and unhealthy versus healthy groups, is a key design decision that should be made when developing and adapting questionnaires. Standardized diet quality metrics have recently emerged that seek to assess consumption of both healthy and unhealthy foods, including the Global Diet Quality Score (GDQS) and the Diet Quality Questionnaire (DQQ). Unhealthy foods are those that contribute to risk of non-communicable diseases (NCDs) and should thus be limited. The GDQS, which also tracks information on quantities consumed, contains a third group: foods that are unhealthy only if consumed in excess quantities. Below is a list of the food groups included in each of the three GDQS categories:

Healthy food group	Unhealthy food groups	Unhealthy if consumed in excess
Citrus fruits, deep orange fruits, other fruits, dark green leafy vegetables, cruciferous vegetables, deep orange vegetables, other vegetables, legumes, deep orange tubers, nuts and seeds, whole grains, liquid oils, fish and shellfish, poultry and game meat, low-fat dairy, eggs	Processed meat, refined grains and baked goods, sweets and ice cream, sugar-sweetened beverages, juice, white roots and tubers, purchased deep-fried foods	High fat dairy Red meat

While GDQS and DQQ are meant to assess food consumption, they are also useful classification systems for foods in the food environment. INFORMAS provides another suggested food categorization that focuses on separating healthy/core food groups from unhealthy/non-core food groups, but this may require further contextualization at country level. At a minimum, classification should aim to identify energy-dense, nutrient poor foods that would not be considered a core part of a healthy diet.

Pros	Cons
• The tool can be easily integrated as an additional module within the Community and Market Mapping Tool and In-Depth Vendor Assessment Tool (Availability of Cost and Affordability).	• In settings where food advertising is highly prevalent, as is often the case in dense metropolitan areas, this tool may add significantly to data collection time.
• Use of photographs can allow flexibility in coding of advertisement content either during or post-data collection.	• Metrics generated from the tool, such as density of food advertisements, represent only potential exposure as opposed to actual exposure, like when wearable cameras capture the advertisements that consumers actually cross paths with-and possibly notice-as they go about their day.
	• Classifying foods/meals advertised as "healthy" or "unhealthy" can be complex due to uncertain ingredients and/or lack of food composition data for some processed foods or the presence of multiple foods within one single advertisement, among other factors.

Tool and indicator validation

Similar tools as that described have been tested by IMMANA in urban, peri-urban, and rural settings of India and Cambodia, and by USAID Advancing Nutrition in Honduras, Liberia, Nigeria, and Timor-Leste (Downs et al., 2025; Downs, Warne, et al., 2024). These pilot tests did not formally assess validity or reliability, but gauged feasibility based on field experiences reported by enumerators, refining tools as required. In India and Cambodia, enumerators were able to administer food and beverage promotion tools relatively easily, revealing that promotion was common in urban areas of Madhya Pradesh, India, but not in peri-urban or rural areas, while in Cambodia promotion took place in all contexts (Downs et al., 2025).

In contrast, a couple of studies based on the INFORMAS protocol for measuring outdoor advertising more formally evaluated inter-rater reliability during the enumerator training phase, focusing on consistent classification of foods advertised into healthy/core versus unhealthy/non-core categories, by comparing enumerator responses to those of principal investigators. There was 40-80% agreement in Ulaanbataar, Mongolia, 54-86% in Manila, the Philippines, and 85-90% in Accra, Ghana (Amevinya et al., 2022; Kelly et al., 2015). In Mongolia and Manila results of the reliability testing were used to guide further training prior to the start of data collection.

Lower-resource adaptations

In settings with limited resources, adaptations to the GDQS tool and data collection methods can help maintain data quality while reducing costs and logistical burdens.

- Purposively sample a smaller set of contrasting urban communities (e.g. middle-income vs. low income as opposed to including all three categories (low, middle, high-income).
- Restrict data collection to food advertisements along a main thoroughfare of each neighborhood or study cluster included in the sample, such as a commercial street used for shopping (this is similar to the Environmental Profile of a Community's Health (EPOCH) study's 'community observation walk' method)(Chow et al., 2010). Note that using this method, it may not be possible to generalize findings from the main thoroughfare to the rest of the study cluster, due to the missing data resulting from street networks not surveyed.
- Gather locations and take photographs of food advertisements only, skipping the coding of advertisements at the time of data collection, then work with 1-2 data analysts to code food groups offered, brands, discounts, health claims made, etc., during the post-data collection phase.

Higher-resource adaptations

Conversely, in high-resource contexts, expanded data collection and broader geographic coverage can enhance the depth and utility of GDQS findings.

- Conduct data collection in a random sample of communities that are representative of all urban areas of interest, stratified by income or socio-economic status (SES).
- Utilize food composition databases to aid in healthy versus unhealthy food classification, by identifying major ingredients and nutrient profiles. Also, consult relevant local or regional guidelines on healthy and unhealthy food classification (e.g. school food policies) to ensure alignment (Kelly et al., 2013).

Sampling and data collection considerations

Sampling procedures should address the selection of neighborhoods or communities (the primary sampling unit), streets, and food vendors within the communities. For researchers interested in assessing food promotion around schools, primary sampling units may instead consist of schools and their surrounding geographic areas (see options for school zone sampling in the box below); this may also apply to other types of institutional food environments.

Selection of communities can be random or purposive. A random sample could be drawn from all urban and peri-urban areas of interest, while a purposive sample could focus on specific areas of interest – such as those where a program is being planned or areas that contrast on some feature (such as income level). The definition of "community" varies by setting and may often consist of smaller geographic areas than those delineated by the lowest administrative units, especially in densely populated urban areas.

Once communities have been selected, additional sampling of streets (for outdoor promotion) and markets and food outlets (for indoor promotion) is needed. Assessment of outdoor promotion can take place in all streets in the sampled community (similar to a census approach), or within a purposively selected sub-sample of streets, such as a 1-kilometer stretch along a main shopping street.

If assessment of indoor food advertisements will take place, sampling can follow that described in the In-Depth Vendor Assessment Tool – additionally, if assessment of availability and prices will also take place, it is recommended to include this Food

and Beverage Promotion Tool as an additional module within the In-Depth Vendor Assessment Tool (for Availability or Costs and Affordability).

Due to the time needed to assess advertisements inside of food outlets (as well as food availability and prices, if those are part of the study), it is not likely feasible to include all vendors in the study area, so additional sampling procedures are needed at this level. Formative information gathering in the study area with key informants and community members may help to identify specific outlet types that are most frequently used by the target population (e.g. wet markets, small retail shops, or mobile vendors), or are the most common access points for specific food groups of research interest.

A sampling frame, or complete listing of vendors in the study area, can be attained from the Community and Market Mapping Tool if a census has been previously carried out, or if local government maintains registries of vendors (though these may not include all informal vendors). Census and In-Depth Vendor Assessment can be carried out simultaneously by programming survey software to randomly select a specified percentage of outlets identified in the census for immediate in-depth assessment. If it is not possible to carry out a census and no public registries are available, other methods such as random-walk sampling can be used to select vendors for inclusion in the assessment, though these are not probability-based samples (Milligan et al., 2004).

If markets are included in the food and beverage promotion assessment, it may be possible for enumerators to map and code all food advertisements inside and around the market area if the market is not very large (or advertisements are not that common). This is in contrast to gathering data on food availability and prices in markets, which typically requires sampling of vendors within markets.

Sampling options for assessing food promotion in school zones

Due to the frequent targeting of children with advertisement of unhealthy foods and beverages and its potential to influence their food preferences, many previous studies have focused on assessing food promotion in school zones (Kelly et al., 2013). Depending on the target age group, assessments may include childcare centers, primary schools, and secondary schools among other institutions serving children. The INFORMAS Protocol for Measuring Outdoor Advertising in School Zones lists several options for defining the boundaries of an assessment area around them:

1. Radial buffers of 500 meters around each school, taking the main school entrance (address) as the center of those buffers;
2. Radial buffers of 500 meters around each school, taking the center of the school as the center of those buffers;
3. Radial buffers of 250 meters from the center of each school adding a school-specific additional buffer proportional to the actual area size of the school (e.g. bigger schools would get a bigger radius);
4. Radial or network buffers of 500m starting from the school polygon boundaries; and
5. Network buffers of 500m from the main entrance of the school (Mackay et al., 2017).

Options 1 and 2 are the most common, but may result in a limited area of assessment depending how much of the buffer is taken up by the school itself. Options 3 and 4 attempt to adjust for this, but require additional information about the size of schools. Option 5 uses street networks instead of Euclidean distance to create buffers, which may be a more accurate representation of the routes children take to and from schools (Mackay et al., 2017).

Illustrative papers using similar methods and indicators

- Mapping of outdoor food and beverage advertising around primary and secondary schools in Kampala city, Uganda (Dia et al., 2021)

- Advertising of unhealthy foods and beverages around primary and junior high schools in Ghana's most urbanized and populous region (Amevinya et al., 2022)

- Density of outdoor food and beverage advertising around schools in Ulaanbaatar (Mongolia) and Manila (The Philippines) and implications for policy (Kelly et al., 2015)

What are possible research questions that could be answered with the Food and Beverage Promotion Tool?

- What is the density of food advertisements in UPU areas studied? How does the density of unhealthy foods compare to healthy foods?

- Does the density of unhealthy food advertisements differ between high and low-SES neighborhoods? Is it higher/ lower around school zones compared to non-school zones? Is there an association between density of unhealthy food advertisements and unhealthy food purchases or diet quality? (requires data on household expenditure and/or diet quality)

- How does the density of unhealthy food advertisements differ between an adolescent home, neighborhood, and school environments? (requires data on adolescent household GPS coordinates)

Urban considerations for the Food and Beverage Promotion Tool

- Food advertising in urban contexts may reflect urban food habits and lifestyles, thus focusing more on fast food, 'take away' dishes/meals, or other foods consumed away from home. With this in mind, it may be advantageous to gather information on menus from prominent restaurant chains and ingredients included in popular dishes – this may be helpful both in classification of foods into food groups, as well as during training of enumerators.

- Research in HICs has shown that children of lower-SES background are targeted more frequently by food advertising than children of higher-SES backgrounds, though these studies are few and so far focused on television advertisements and advertisements in public transportation networks (World Health Organization, 2023); sampling in U-PU areas of LMICs can try to allow for similar comparisons to be made, for example, by stratifying samples to include communities or schools of different SES.

- Outdoor advertisements in U-PU contexts may appear in a variety of different locations, for example on or around transportation infrastructure, such as bus shelters. Formative information gathering through transect walks or community observation can allow for refinement to questions about the types and locations of advertisements.

- Mobile phone and social media usage among children and adolescents in U-PU contexts may be high. Prior to usage of this tool, it may first be useful to gather information about the salience and relative importance of food advertising outdoors, in food outlets and markets, and in the digital environment. If digital food advertising appears to have much more persuasive power, alternative assessment methods may be justified.

Resources related to the Food and Beverage Promotion Tool

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