Developing a research agenda to support improvement in the healthiness of urban retail food environments in the **East Asia and Pacific Region**





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Executive Summary

Unhealthy diet is the leading risk factor for chronic disease worldwide. The steady rise over several decades in the prevalence of overweight and obesity among children in almost all countries in the East Asia and Pacific (EAP)¹ region has been attributed to increasing over-consumption of unhealthy ultra-processed foods and insufficient consumption of healthy fresh foods. Over-consumption of unhealthy foods has occurred in parallel with undernutrition in most Low and Middle-income countries (LMICs), creating a double burden of malnutrition. Food systems that prioritise the supply and marketing of cheap, palatable, energy-dense foods have been identified as the key driver in the epidemic of unhealthy eating and obesity. Given that most food consumed is sourced from a retailer of some type, retail food environments are key settings for shifting consumers to healthier purchasing and consumption practices.

Economic development and demographic changes in EAP have resulted in a transition in both retail food environments and diets. Key changes in retail food environments include a rise in the number of supermarkets, hypermarkets and convenience stores, coupled with increasing online food retail and a simultaneous reduction in the use of traditional fresh and informal retail outlets. While these changes have offered benefits, such as increased convenience, high levels of food safety and relatively low prices, evidence strongly suggests that the changes to retail food environments have also resulted in a strong bias toward marketing of less healthy, pre-packaged foods and this has contributed to less healthy population diets, including for children.

The aim of this briefing paper is to support UNICEF in the development of a research agenda for generating improvements in the healthiness of urban retail food environments in EAP. The paper first describes different retail food environments and how they impact population diets. We then summarise the research methods, tools and data sources that can be used to generate evidence for influencing the healthiness of retail food environments. Three areas of research are identified as the primary targets for influencing retail food environments. These include:

- 1. Mapping, describing, and understanding the food retail landscape
- 2. Working with retailers to test interventions, including in natural experiments, and
- 3. Building the evidence for laws and policies related to retail food environments

A summary of research methods and existing evidence in relation to each of these areas is presented below, followed by a table of research priorities to guide UNICEF actions in this area.

Mapping, describing, and understanding the food retail landscape

Very little of the literature describing and mapping retail food environments comes from EAP. The tools available to assess retail food environments vary significantly in their purpose, approaches and feasibility. A highly targeted, mixed methods approach (i.e. using both quantitative and qualitative methods) that examines aspects of interest is likely to be the most useful, especially in examining informal retail food environments. Food environment measures need to be adapted to context (geographical, or retail

¹ Countries in the UNICEF EAP region: Brunei Darussalam, Cambodia, China, Cook Islands, Fiji, Indonesia, Kiribati, Korea DPR, Laos PDR, Malaysia, Marshall Islands, Micronesia, Mongolia, Myanmar, Nauru, Niue, Palau, Papua New Guinea, Philippines, Samoa, Solomon Islands, Thailand, Timor Leste, Tokelau, Tonga, Tuvalu, Vanuatu and Viet Nam

setting) and informed by the aim and objectives. The resources available for data collection and analysis should also be taken into account.

Population surveys, household expenditure analyses, market surveys and 'on the-ground' observations can provide an important understanding of the ways that retail food environments are used by different groups, and how different characteristics of retail food environments influence population diets.

Working with retailers to test interventions in retail settings

Testing interventions (or 'nudges') designed to encourage healthier retail food environments is an important way of demonstrating that such interventions can be both good for public health and good for business. Demonstrations of success are an important way of encouraging other retailers to follow suit.

An increasing number of trials and natural experiments have been conducted across a range of retail types (including supermarkets, corner stores, remote stores, vending and restaurants), and testing a range of nudges across the 4Ps of marketing (price, product, placement and promotion). The majority of these interventions demonstrate some change toward healthier purchasing and/or consumption, however very little research has been conducted in informal settings, in the EAP region, or in LMICs globally. Research that reports outcomes relevant to both health and business is recommended.

Building the evidence for laws and policies related to retail food environments

The economic, regulatory and political environment shapes the characteristics of retail food environments. Policies from multiple levels of government, as well as food industry policies and commitments, have an influence on the foods available for sale, the marketing of those products and their relative prices. For children in particular, who are a vulnerable group that warrant societal protection, governments have a fundamental role in protecting their right to enjoy the highest attainable standard of health by taking measures to combat malnutrition, thus helping to make healthy choices the easy choices.

Almost all policies that encourage healthy retail food environments have only been adopted very recently. These have been from diverse settings that include LMICs and represent a powerful precedent. Given the nutrition and retail transition occurring in much of EAP, an important focus for research is policies that might also shape the retail food environment of the future.

Research recommendations

Prioritised research recommendations designed to improve the healthiness of retail food environments in EAP can be divided into: i. **Short-term** (pieces of work that can be completed in the next 6-12 months); ii. **Medium-term** (projects that can be completed in the next 1-3 years); and iii. **Longer-term** (programs of work that can be carried out over the next 5 years) projects.

Based on available literature and the expert knowledge of the authors, a number of research priorities have been identified that could help UNICEF improve the healthiness of urban retail food environments in the region (see summary table below). The next phase of this work is to share these priorities via an expert webinar and further evolve and refine them into a plan of action.

Based on their potential impact and cost, projects recommended as being the highest priorities for initial funding (marked with asterisks in the table below) include:

- Develop or adapt audit tools for assessment of the healthiness of different retail food environments, to be used as part of country landscape analyses
- Mapping of changes in retail food environments over time in all EAP countries using aggregated data sources
- Continue to build an alliance of those interested in encouraging healthier retail food environments in EAP
- For a small number of countries, identify promising potential policy options and the types of evidence required to support them

Mapping, describing, and understanding retail food environments	Testing interventions to promote healthy retail food environments	Policies related to retail food environments
(short term) For a targeted set of countries, conduct an audit of existing data sources that could inform research into retail food environments, including from national level surveys, market basket surveys and aggregated data reports (including in relation to COVID-19)	(short term) Identify a range of in-store changes (particularly those most likely to impact children) across different settings (e.g. supermarkets, convenience stores, take-aways) that could be tested in the context of EAP, based on discussions with key informants, in-store audits, proposed policies and the results of trials elsewhere. Identify the appropriate study design and evaluation methods required for research testing these changes.	**(short term) Build an alliance of policy makers, academics and others interested in encouraging healthier retail food environments in the region, including engagement with existing city-level food system initiatives. Could involve an ongoing series of webinars, as well as online networking and a web presence
(short term) Investigate the potential to add EAP countries to the International Food Policy Study, an annual survey of ~4000 adults and youth in each of 6 countries on topics related to food policy and diet, allowing for direct comparisons over time and across countries.	(short term) Identify retailer champions wishing to be involved in trials that might promote their business as a health promoting retail environment and consider business outcomes likely to be important to them	**(short term) For a targeted set of countries, identify the types of local evidence required to support adoption and implementation of promising policy options relating to retail food environments (particularly those most likely to impact children)
**(short term) Using available aggregated data sources, update and expand previous work mapping the growth of supermarkets and convenience stores in EAP countries	(short term) Continue to develop best practice protocols and guidelines for engagement with retailers that considers and mitigates (as far as possible) the inevitable conflicts of interest that arise	(medium term) Commission studies to generate evidence to support adoption and implementation of promising policy options identified above
**(medium term) Develop composite measures (incorporating elements such as: food availability, price, promotion and placement, nutrition information) to describe the healthiness of: a) informal food retail; b) food courts/formal markets; c) shopping districts (e.g. shopping centres/suburbs)	(short term) Identify existing projects in the region and elsewhere that support retailers to implement best practice healthy food retail initiatives (particularly those most likely to impact children) and adapt these to the context of EAP	(medium term) Develop indicators for benchmarking local- level actions for improving the healthiness of retail food environments, including benchmarks of best practice
(medium term) Use qualitative methods to understand ways in which children (and their caregivers) are influenced by retail food environments, and how they impact food purchasing decisions	(medium term) Utilise the network of academics, health promoters, policy makers and others (see recommendation in policies section) to promote and encourage the use of retailer support tools	(longer term) Development and implementation of accountability mechanisms for improving the healthiness of retail food environments. These should be embedded as part of broader initiatives (e.g. INFORMAS, ATNI) and include routine benchmarking of policies and practices of governments (local/national), retailers and manufacturers
**(medium term) Develop and adapt in-store audit tools to assess the availability and promotion of healthy and unhealthy foods in different retail settings (e.g. supermarkets, convenience stores, take-away food outlets), tailored to EAP contexts (longer term) Apply metrics/indexes for measuring food environments (both in-store and composite indices – see above), in a range of settings, and repeated over time	(longer term) Conduct trials of interventions testing healthier nudges (including discouraging the purchasing and consumption of unhealthy foods) in EAP, with a view to scale up at a chain, national and regional level	(longer term) Evaluation of any new policies implemented, using indicators developed as part of previous projects

Introduction

2.1 Aim

The aim of this briefing paper is to support UNICEF in the development of a research agenda for generating improvements in the healthiness of urban retail food environments in East Asia and the Pacific (EAP).

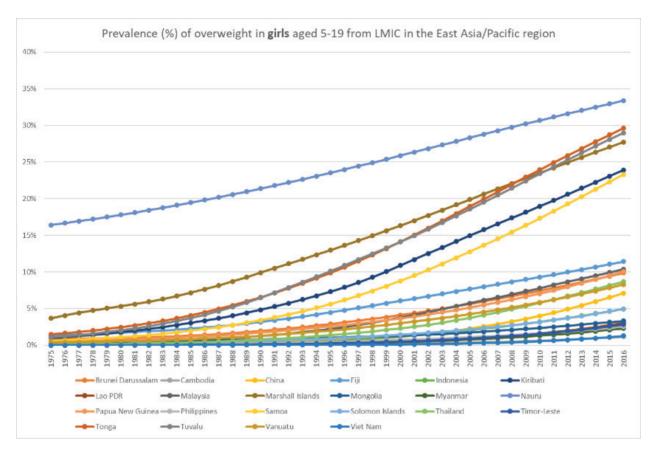
2.2 Overview of this document

The first section of this briefing paper describes different retail food environments and their impact on population diets. The next three sections then focus on three areas of research identified as the primary targets for influencing retail food environments, including: i. Mapping, describing, and understanding the food retail landscape; ii. Working with retailers to test interventions, including in natural experiments; and iii. Building the evidence for laws and policies related to retail food environments. Examples of each from EAP are provided. Finally, we identify research priorities to guide UNICEF actions in this area.

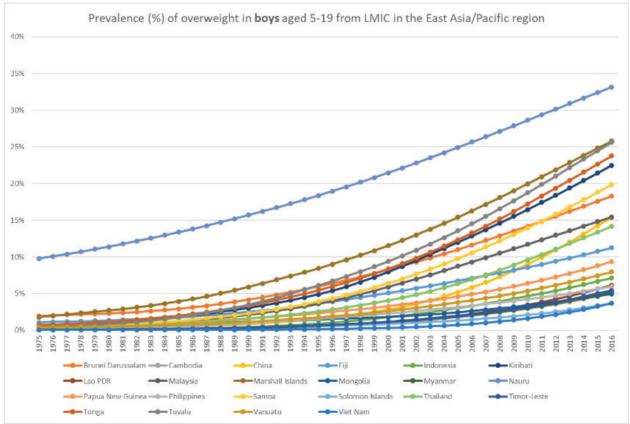
Note that peer-reviewed research is referenced in-text, with a list of references at the <u>end of this document</u>. Other online sources of information are hyperlinked.

2.3 Problem statement

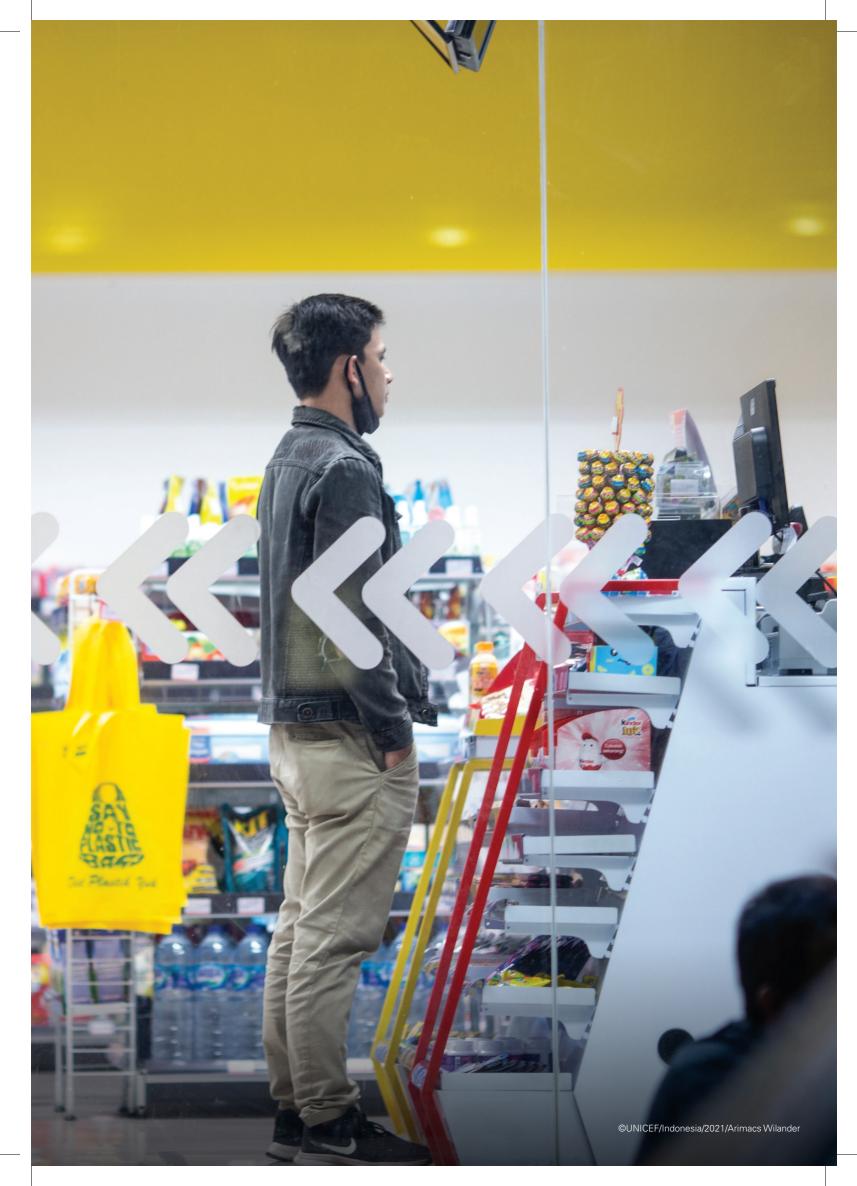
Unhealthy diet is the leading risk factor for chronic disease worldwide, and in many countries leads to poor health outcomes, including overweight and obesity, type 2 diabetes, cardiovascular diseases, cancer, dental decay, mental health problems, and most recently, more severe impacts of SARS-CoV-2 among obese individuals¹. The prevalence of overweight and obesity has been rising steadily in almost all countries in EAP, including among children, for several decades, with no evidence of a decline or even plateau (see Figure 1). Many individuals globally are consuming too much unhealthy food and drink, such as sugar sweetened beverages (SSBs), and too little healthy food, like fruit and vegetables. The increase in the consumption of ultra-processed unhealthy foods has occurred in parallel with undernutrition in most LMICs, creating a double burden of malnutrition². Novel solutions that target dietary risk factors and the food environments that encourage them are needed to turn the tide on a growing burden (and double-burden) of diet-related disease, with change to the retail food environment increasingly recognised as an important target.







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Retail food environments and why they matter

3.1 What is a "retail food environment"?

Food <u>retail</u> is the activity of selling food to individuals for personal consumption. The term <u>food service</u> refers to the preparation of food for large groups of people, for example in schools, hospitals, companies etc. The sale of individual meals for immediate consumption by restaurants, street vendors, mobile vendors and cafes involves attributes of both retail and food service. Further blurring the lines between these categories is the increasing sale of pre-prepared full meals by convenience stores and supermarkets.

For the purposes of this briefing paper, "retail food environments" are considered to be those where any food is sold (with money changing hands) to individuals for personal consumption, either immediately or later. Therefore, excluded from this definition are food provided to hotels, schools, hospitals, prisons, workplaces and similar institutions (considered to be food service activities). Restaurants, cafés, kiosks, vending machines and street food vendors are all considered to be retail food environments, in addition to food markets, convenience stores, supermarkets and hypermarkets, and anywhere else that sells food to individuals, including online.

Packaged food manufacturing, formulation, labelling and taxation are not the focus of this paper while agriculture, the distribution of food and food supply chains leading up to food retailers are also not included. Alcohol and breast-milk substitutes are excluded from scope as are rural retail food environments which are likely to have both similarities and differences when compared to urban retail food environments.

3.2 Types of retail food environments

Retail food environments represent the interface between individuals and the food system, and include a broad range of settings, from fresh food markets to street food, supermarkets, online traders and vending machines. The procurement of food from these environments may be in person or delivered by the retailer or a third-party distribution company. The range of food retail settings, including both informal and formal, is presented in **Figure 2**. Given that most food consumed is sourced from a retailer of some type, the retail food environment is a key setting for shifting consumers to healthier purchasing and consumption practices^{3,4}.

Figure 2. Types of formal and informal retail food environments (adapted from Downs et al. 2020)⁵



3.3 Defining healthy food and healthy retail food environments

"Healthy retail food environments" are those that encourage the purchase and consumption of healthier foods and drinks by supporting the relatively greater availability, affordability, accessibility and promotion of healthier compared to less healthy alternatives. Some retail food environments can readily be classified as healthy (traditional markets selling fresh produce), or unhealthy (fast food restaurants that only sell unhealthy foods), but most retail food environments exist somewhere along the continuum between these two extremes, selling a range of healthier and less healthy foods. The inability to simply define a healthy retail food environment is one of the challenges for research in the area (refer to Section 4.2.3 for further details).

In relation to individual products, product healthiness can be estimated through detailed analysis of nutrient content and can be summarised using food classification systems (such as nutrient profiling systems). Food classification systems can involve discrete categorisations (e.g. dichotomous systems) that divide food into healthy and unhealthy, or continuous measures that rate food along a spectrum (e.g. healthier to less healthy).

Food classification systems can be used in food policy development and implementation (e.g. guidelines for marketing or promotion of food), or in health promotion. Classification systems likely to be most useful for categorising foods in retail food environments in EAP are those based on nutrient profiling and those based on the level of food processing.

In relation to nutrient profiling, the most prominent systems in the region are the World Health Organization (WHO) <u>Nutrient Profile Model for the South-East Asia region</u> and an equivalent for the <u>Western Pacific region</u> that were developed for the implementation of recommendations on unhealthy marketing to children but can be used more broadly. These models can be used as a guide and should be adapted and tested to reflect the context in individual countries. Front-of-pack labelling systems based on nutrient profile models, such as <u>Australia's Health Star Rating system</u>, are also increasingly used for a wide range of food classification purposes, and are likely to be suitable for use in the region.

In relation to level of processing, the NOVA classification⁶ is based on four discrete levels of processing:

- (i) Unprocessed or minimally processed foods (e.g. whole fruit, nuts and seeds)
- (ii) Processed culinary ingredients (e.g. sea salt, flour)
- (iii) Processed foods (2 or 3 ingredients e.g. salted nuts, cured meat)
- (iv) Ultra-processed food and drink products (e.g. chocolate, breakfast cereals)

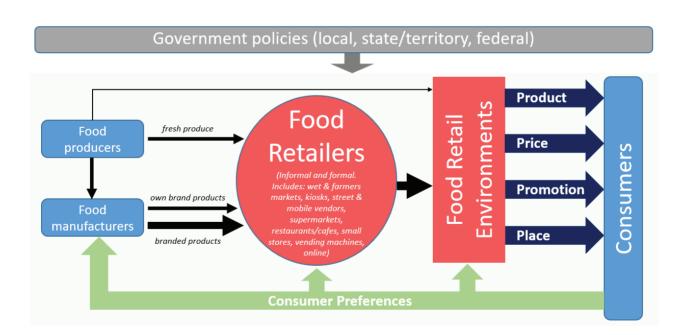
Implicit in NOVA is the understanding that natural or minimally processed foods are associated with the best health outcomes and their consumption should be encouraged whenever possible⁷.

3.4 Marketing in the retail food environment

Retailers typically use a variety of marketing techniques to drive increased purchasing and enhance profitability. For simplicity, these techniques can be classified using the classic "four Ps of marketing" (Price, Promotion, Place, and Product), although in reality these are typically combined together as part of integrated marketing strategies. Marketing techniques interact with consumers' personal circumstances and preferences to influence their purchasing decisions and broader social norms⁸. Further, retailers' interactions with food manufacturers and suppliers impact what is available for purchase⁹. Larger (often multinational) food companies and retailers are most able to afford to pay for marketing strategies, with a strong bias toward marketing of less healthy, prepackaged foods most likely to be purchased on impulse¹⁰⁻¹² in settings such as supermarkets, corner stores and kiosks, where most food is purchased globally.

A summary of the factors influencing retail food environments and ultimately customers is presented in Figure 3.

Figure 3. Factors affecting the retail food environment (adapted from Peeters et al. 2018)¹³



3.5 Retail food environments in East Asia and the Pacific and their impact on health

Economic development and demographic changes in countries from EAP have included a significant food systems transition that has favoured a modern or commercialized retail food environment. For example, in Vietnam, the government have adopted plans to promote a <u>massive increase in the number of supermarkets</u> while at the same time reducing the number of traditional markets. Chain convenience store like 7-eleven and Circle K are prominent in many countries such as Thailand and the Philippines, with rapid expansion across other countries in the region such as <u>Laos and Cambodia</u>. In a 2012 analysis of the "supermarket revolution" in Asia, it was noted that the speed of transition is increasing rapidly¹⁴.

While convenience, food safety and (sometimes) price are the important benefits of modern retail food environments like convenience stores, supermarkets and hypermarkets, evidence strongly suggests that shopping from these food sources is linked with less healthy diets¹⁵. In a recent Lancet article on the causes of the obesity epidemic, "the increased supply of cheap, palatable, energy-dense foods; improved distribution systems to make food much more accessible and convenient; and more persuasive and pervasive food marketing" were identified as the likely drivers¹⁶. All of these are hallmarks of modern food retail, which includes a simultaneous reduction in the use of traditional fresh and informal retail outlets. In a recent review of the transformations of food systems in Asia, it was noted that "Supermarkets, hypermarkets and convenience stores were becoming increasingly dominant as distribution channels for packaged foods throughout the region"¹⁷. Evidence from a cohort study in Thailand shows that after adjustment for age, sex, income, retail availability and rurality, individuals who predominantly shop in supermarkets consume more unhealthy foods than those who shop from fresh markets or both retail sources¹⁸. A recent wearable camera study of children's interaction with food in convenience stores (in New Zealand) found unhealthy food dominated availability as well as children's purchases¹⁹, while mothers with unhealthier feeding practices have been shown to be more willing to purchase nutrient poor foods requested by their children in supermarkets²⁰. Not all individuals are equally impacted by the retail transition, however, with a strong socio-economic gradient in retail preference typically observed (lower income individuals preferring cheaper traditional and informal retailers over more expensive supermarkets)²¹. The parallel reduction in the number of traditional markets has important health as well as equity implications, with many lower income individuals relying on these for affordable and nutritious foods⁸.

The transition of retail food environments in many parts of EAP represents an ideal opportunity to guide the development of future retail models that can promote health. Based on the experience in high income countries throughout the world, it is incredibly difficult to modify the retail food environment once it has been established¹⁶, meaning that this opportunity may be time limited. Children born into an obesogenic food environment grow up with this as a social norm, with the predictable outcome being the ongoing global pandemic of excess weight in childhood.

The WHO has called on governments to "[develop] policy measures that engage food retailers and caterers to improve the availability, affordability and acceptability of healthier food products"²². Although encouraging individuals to make healthier food choices via marketing or education initiatives is important, this is unlikely to be effective in influencing behaviours where the retail food environment is strongly promoting less healthy foods and beverages.

Increasingly, evidence demonstrates that it is possible to shift the retail food environment to one that promotes and markets healthier food. Research evidence is crucial to stimulate that shift and demonstrate how best to create healthier retail food environments that can also align with retail business interests and outcomes, customer demand, equity concerns and ecological sustainability imperatives.

3.6 Influencing retail food environments

Based on the review of the literature described below, and our combined knowledge of ways that retail food environments can be influenced, the three research actions that can be most helpful in supporting healthy retail food environments in EAP include:

1. Mapping, describing, and understanding the food retail landscape

Necessary to understand what to change, and can be used to influence customer perceptions and policy (corporate and government)

2. Working with retailers to test interventions in retail settings, including natural experiments

Necessary to provide evidence that changes are effective, feasible and sustainable

3. Building the evidence for policies that can improve the healthiness of retail food environments

Necessary to inform government and corporate policies and practices

This briefing paper therefore focuses on these three areas of research, identifying the methods available, describing existing research in this area and identifying research gaps and priorities that UNICEF can use to guide evidence-based action.

Tools and methods for mapping, describing, and understanding urban retail food environments

4.1 Introduction

Assessing the retail food environment landscape is valuable to understand differences across and between jurisdictions, to develop an effective and targeted policy response, and to enable monitoring of interventions to promote healthy food retail in EAP.

A rapid review of tools for developing an evidence base on retail food environment landscape was conducted, with the methods described in <u>Appendix 1</u> and a summary of findings presented below. A full description of the findings is found in <u>Appendix Table 1</u>.

Two distinct approaches for assessing retail food environments include observational approaches that assess the physical environment (both in-store and geographically), and approaches that assess how individuals interact with the retail food environment (individual approaches). A description of the various methods used in each area, as well as their relative advantages and disadvantages, are summarized below.

4.2 Observational approaches

4.2.1 Aggregate food supply data

This provides information at a sector level, which is useful for identifying priority areas and industry trends over time. Regular reports on the retail sector in individual countries include market share of different companies and sectors (e.g. supermarkets, traditional markets, convenience stores) and analysis of trends.

An example is the Euromonitor Passport Global Market Information Database which collates food and beverage sales data for the 80 largest country markets using data from trade associations, industry bodies, business press, company financial reports, company filings, and official government statistics. For the remaining 130 countries, modelled data is generated through a model that allocates each included country a researched approximator country.

Examples of the use of Euromonitor data in Asia include i. A 2013 assessment of trends in food availability, healthfulness and brand market share (particularly

in relation to ultra-processed foods) at the national level for specific brands and sectors¹⁷²³, ii. Analysis of sales of highly processed food and drink by UNICEF China, and iii. Examination of the relationship between the size of supermarkets (sqm, as a measure of retail food culture) and national obesity prevalence, including specifically in Asian countries (manuscript in preparation), with the finding from this ecological study being a strong linear correlation between supermarket size and obesity²⁴. Other sources of food supply data include the <u>FAO</u>, and <u>IBISWorld</u>.

Advantages

- Useful for identifying priority areas and industry trends over time
- This type of data is not subject to recall bias, unlike survey data, and is consistently reported across all countries over time using standardised measures²⁵
- Potentially useful for monitoring the impact of national food policies

Disadvantages

- Does not capture products sold through informal channels
- Data is aggregated, and so not always sensitive to changes and nuances at local levels
- Data not validated, and (for Euromonitor Passport), data for over half of the included countries is based on approximator countries, for which accuracy has been disputed^{25,26}
- Access to Euromonitor is via subscription. Some academic institutions have access to Euromonitor via the Euromonitor Passport Global Market Information Database, although access may be limited for institutions from EAP
- Potential limitations due to data availability. As one example, Euromonitor Passport doesn't take into account food wastage

4.2.2 Geospatial approaches

Geospatial approaches often use geographic information systems (GIS) and are prominent in the retail food environment literature²⁷⁻³⁸. They are typically used to capture the density and proximity of food retail outlets within a geographical location using geocoded retail outlet data (e.g. business registration)²⁹. In some cases, where resources permit, they can use web-based food mapping using geocoding services or interactive websites³⁰, or by applying Global Positioning Systems (GPS) to manually map food retail exposures of an individual as they move through a specific area³⁷³⁸. In some cases, depending on data quality, outlets can be crudely classified based on their healthiness (e.g. as 'healthy' or 'unhealthy') based on predetermined categorisations aligned to proprietary classification (e.g. federal business registration), defined by the literature, or by manual collection of data against retail type²⁹.

Business or commercial databases represent a potential source of data to use in geospatial analysis for the purpose of monitoring the retail food environment³⁹⁻⁴⁹. Typically, these databases provide lists of businesses, including food outlets which are broadly classified by outlet type, and provide business names, revenue and addresses. In some cases, food outlets can be geocoded based on their addresses and the density and proximity of different types of food outlets (relative to a point, such as a participant's address) can be calculated. These data sources have also be paired with population level surveys to analyse the impact of the retail food environment on overweight and obesity^{39-43,45,47}, dietary intake⁴⁶ and high blood pressure⁴⁷.

Advantages include:

- In many cases, these data are routinely collected by governments or venue operators (e.g. markets) as part of business registrations or licensing. However, access to this data by researchers may be restricted and it may not be in a format that allows analysis related to healthiness
- Data for specific local settings, e.g. individual neighbourhoods or shopping districts, can be readily collected manually

- Where data is available and coded in an appropriate way, it can provide information to enable comparisons of the nature of retail food environments across time and space in order to assess change over time and differences between areas
- Measures both proximity (including to home and schools) and density of outlets, which cannot be measured using other methods ^{27,28}
- Objective and efficient compared with individual methods 50,51
- Government officials are likely to be familiar with using this type of data for various purposes such as urban planning²⁹
- Geospatial methods can be applied available in most urban settings
- Potentially could be used as part of efforts to create indexes of the healthiness of retail food environments in areas (e.g. shopping districts, municipalities, cities)⁵²
- Can be combined with subjective data to examine correlations between outlets and food intake (i.e. the influence of outlets on purchasing patterns) ^{34,35,46}

Disadvantages include:

- A very rough summary that does not take into account how people use their environment meaning the value of combining with population health data (for instance obesity prevalence and quick service restaurant density^{27,34} or socioeconomic position and fast-food exposure³¹) is minimal
- Definitions of healthy and unhealthy retail types are challenging and typically crude⁴⁶ (e.g. supermarkets are often classified as 'healthy' and service stations as 'unhealthy')²⁹
- Limited to assessment of proximity and density²⁹
- Methods that assess individual's use of food environments (e.g. GPS mapping of children's movement paths ^{32,33}) are often resource intensive meaning very small sample sizes
- Existing databases do not capture the informal food environment
- Almost all examples of the use of business datasets are from the USA ^{39-43,45-48,53}. The transferability of such methods to other contexts, in particular to EAP is uncertain

4.2.3 Retail food environment surveys

- Surveys are a commonly applied method for examining the within-store retail food environment, including
 marketing activities in the retail context. The <u>INFORMAS</u> network (an international network dedicated to
 monitoring and benchmarking food environments, currently active in >50 countries see box below) is
 developing standardized step-wise methods for monitoring retail food environments globally⁵⁴, with a
 protocol now used to measure supermarket food environments in Australia⁵⁵ and New Zealand⁵⁶. That
 tool included assessment of the shelf space of a range of healthy and unhealthy food categories and the
 healthiness of food at checkouts and end-of-aisle displays. Price promotions applied to unhealthy foods
 were also assessed using that tool.
- One of the most widely used tools is the <u>Nutrition Environment Measures Survey</u> (NEMS-S for stores, NEMS-R for restaurants, NEMS-CS for corner stores, NEMS-V for vending and NEMS-GG for grab and go). These tools, developed in the USA, have been adapted for use in several countries from EAP, including China⁵⁷⁵⁸, Singapore⁵⁹ and American Samoa⁶⁰. Although the NEMS-S and NEMS-CS tools capture the availability and price of various (mostly healthy) foods, they do not capture many of the most important elements contributing to store healthiness, including placement, shelf space and price promotions of both healthy and unhealthy foods.

Advantages include:

• These types of tools can be useful for detailed 'mapping' of existing retail food environments, which can then be used to develop and evaluate actions that change the retail food environment.

- Can be used to examine the associations between the availability of food retail outlets and dietary intake or food purchasing behaviour ^{31,34,61}
- Useful for monitoring food retail interventions, and retailer-specific food environments (i.e. comparing chains) ⁶².
- Tools available for a range of settings including supermarkets, small stores, quick-service restaurants and vending ^{51,62-65 66}
- A repository of 367 (mostly US) measures of the food environment is available here
- UNICEF have previously conducted food environment surveys in Latin America and the Caribbean⁶⁷

Disadvantages include:

- Most tools are from high income settings and are highly context-specific⁶⁸, with many unvalidated in other settings ⁶⁹
- Usually focus on only one or a limited number of aspects of food environments (e.g. availability, price, marketing, promotion, price promotion, social context, or competitive environment) and thus do not provide a comprehensive and synthesised overview of characteristics that influence food purchases ^{55,70}
- Few tools designed for informal retail settings, although tools for auditing farmers markets ⁷¹ and the broader informal food environment (in Africa ^{72,73}) have been developed
- Relatively resource-intensive and therefore not suited to delivery across large geographical areas or being repeated regularly
- Can require significant analytic capacity to transform, categorise and code the data 44

INFORMAS and how it relates to retail and children

The International Network for Food and Obesity / Non-communicable Diseases (NCDs) Research, Monitoring and Action Support (or INFORMAS) is a global network of public-interest organisations and researchers that aims to monitor, benchmark and support public and private sector actions to increase healthy food environments.

INFORMAS is currently active in >50 countries, with activities divided into 11 modules: Communication, Food Labelling, Food Provision, Food Prices, Population Diet, Private Sector Policies & Actions, Food Composition, Food Promotion, Food Retail, Food Trade & Investment, Public Sector Policies & Actions.

Although many of these modules may influence the food products available, their price and promotion, the **Food Retail module** is specifically focused on monitoring and benchmarking retail food environments in order to assess the density of (and proximity to) healthier and less healthy food outlets and the availability and promotion of healthy and less healthy food in-store.

The **Food Promotion module** is designed to assess the exposure (and effects) of promotion of unhealthy foods and beverages to different population groups, and especially children. Food promotion in retail settings is considered in both the retail and food promotion modules

The **Private Sector Policies and Actions module** seeks to assess how private sector organisations impact food environments and obesity/NCD prevention efforts. It includes assessment of company policy and practice, including for retailers. Policies assessed include those related to marketing to children.

4.2.4 Market basket methods

These measure changes in the price of purchasing a given "basket" of consumption goods and services ^{74,75} that represent a 'healthy' diet for one or more persons ⁷⁶.

Advantages include:

- The "basket" of goods can be obtained from a mix of settings, including both formal and informal markets, allowing for the inclusion of a diverse range of retail food environments and comparison across them
- Can be tailored to the cultural and social context where they will be used ⁷⁶

Disadvantages include:

- Context and time specific
- Typically, only includes a small number of products
- Primarily used to measure price, and so does not consider other aspects of retail food environments, such as marketing, information, product placement etc.

4.2.5 Application of observational approaches in informal food retail settings

Although informal retail food environments are a key source of food in EAP, we found few studies that assessed their nutrition-promoting elements. A search for measures of the informal retail food environment largely yielded tools and mapping related to safe food handling. For example, a 2011 <u>WHO Regional consultation on safe street foods</u> discussed vendor audits, but these did not include approaches to measure or address nutrition or food quality. A 2009 WHO/FAO inter-regional meeting to discuss the promotion of healthy informal food settings surveyed multiple countries regarding their actions to improve healthiness of street food and the informal food sector.⁷⁷ Country delegations from Bangladesh, Cambodia, India, Indonesia, Malaysia, Mongolia, Philippines, Sri Lanka, Thailand, Vietnam reported actions related to food safety and nutrition of street foods, with no evidence of mapping of this sector. Singapore, however, reported regular monitoring to be one of their three key strategies for promoting healthier street food (along with influencing demand for healthier food among consumers, and "generating buzz to encourage trials and build confidence"). Singapore reported that 40% of 13,000 stalls across hawker centres and coffee shops had at least one healthier option. We located two studies from Africa where researchers had applied small-scale observational methods to engage with food vendors and customers on health, hygiene and nutrition promotion^{72,73}. The informal food retail market has also been measured through environmental surveys⁷¹, market basket tools⁷⁶ and vendor surveys^{72,73}.

There are inherit challenges in measuring informal food, in that informal vendors are highly mobile, and vary substantially between peak and off peak times ⁷⁸. Some of the tools outlined above lend themselves to measuring aspects of informal food for instance market basket surveys efficiently measure food availability and price (both spatially and temporally). Objective methods, though more resource intensive, can be used to measure almost any food environment domain.

4.3 Individual approaches

Individual data sources are used to examine the way that people use retail food environments, including drawing on the views and experiences of both customers and food vendors.

4.3.1 Customer survey data

Surveys of customers have been used to measure various domains and typologies of the retail food environment, including perceived proximity and availability of food outlets ^{50,51,79-82} and perceived healthfulness of food outlets ⁸²⁻⁸⁶. Research shows moderate ⁵⁰ to poor ⁵¹ correlation between subjective individual assessments and GIS-based measures of the retail food environment.

The <u>International Food Policy Study</u> (IFPS) is an example of an efficient customer survey (repeated annually) that draws on existing consumer panels in six countries, using a standardized protocol to assess perceptions and values, experiences, guideline and regulation interpretation, food and nutrition knowledge and dietary intake (using the online <u>ASA24 tool</u>) in a range of countries.

Separate surveys are utilised for adults and youth (aged 10-17), with surveys currently undertaken in USA, Canada, UK, Australia, Mexico and Chile (youth survey only). The IFPS is very open to the addition of new countries, with the aim of the study being to evaluate the impact of national-level food policies in some countries, while using others as controls. While some existing questions in the IFPS assess food retail specifically⁸⁷, countries are also able to add their own questions on topics of particular interest.

4.3.2 Routine survey data

National government surveys on population expenditure and consumption are undertaken in 95% of all countries ⁸⁸⁻⁹⁰. Predominantly, these surveys collect food and beverage purchase and consumption information through food diaries or 24-hour dietary recall surveys. These can provide food acquisition data (quantity and value) at an individual or household level, or by geographic area, and can be used to assess the number and proportion of households that purchase particular types of foods against different geographical locations and household characteristics. Some countries have included categories to capture multiple categories of dishes, and many make explicit mention of food eaten outside the home. Food acquisition diaries often record whether foods are purchased or acquired, creating potential for governments to add additional specifications that would aid the long-term evaluation of policy initiatives. FAO has recently developed a software package to enable the extraction of food security statistics from national household surveys⁹¹.

Advantages include:

- Can draw from existing routine data to inform policy, with data based on census samples ^{88,89}
- Surveys recruit large numbers of participants and are largely representative of the populations in the countries where they are conducted ^{88,90}
- Surveys can be used in conjunction with other surveys to incorporate other measures, such as anthropometric data ⁸⁹
- Relative to many objective and subjective methods, expenditure surveys offer a potentially efficient means for monitoring the retail food environment

Disadvantages include:

- Relatively long periods between surveys (often 3-12 years)⁸⁸
- Government stakeholders would need to see benefit to any modifications to surveys that would allow further disaggregation of food access and retail information ⁹⁰
- Accuracy of surveys has been broadly questioned, and as they are non-standardised, accuracy may differ between countries^{88,90}
- These surveys have also been criticised for not capturing the nuances of food consumption within households, including missing the distribution of food and nutrient intakes and the temporality associated with food choices throughout a year ^{88,90}

4.3.3 Consumer panel data

Consumer panels such as those operated by Nielsen in many countries are commercial enterprises run in order to provide market research to customers such as food manufacturers, retailers, researchers and others and provide an objective and relatively accurate source of information on household food and beverage purchases. Individuals who are part of these panels take an inventory of the food and beverage products that they purchase and pass on their data to the proprieter⁹².

Consulting firms that work in fields related to the food retail sector in countries or regions (including those like Kantar and Nielsen that collect panel data) have been contracted to study aspects of the retail food environment in other regions. For example, UNICEF in Central and South America⁶⁷ engaged Kantar to conduct store audits and interviews with 10 individuals in management of leading retailers in Argentina, Brazil, Colombia and Mexico.

Advantages include:

- Consumer panels exist in many countries globally
- Data can be used to assess the availability and purchase of a complete range of food products in formal markets
- Can also be used to assess availability, price and healthfulness
- Data is comparable across countries and aggregated at the national level

Disadvantages include:

- Consumer panel data is typically very expensive, with datasets needing to be purchased on a by-country basis
- Does not include informal food sources
- Data analysis is somewhat complex

4.3.4 Other individual methods include:

- <u>Crowdsourcing</u> technology using a mobile phone app to aggregate individual perceptions on food environments⁹³
- <u>Interviews</u> with customers⁹⁴ and vendors^{72,73}, with these references being to work assessing the informal retail food environment. Some instruments have been formally validated ^{79,82}
- <u>Direct observation</u> by experienced anthropologists, which may give the most in-depth assessment of how retail food environments are used, and why and how the local culture interacts with the food environment. Examples demonstrating the value of this approach included an investigation of who uses supermarkets in Vietnam⁸ and an assessment of how traditional local food cultures in Mexico might be supported ⁹⁵
- <u>Ecological Momentary Analysis</u> (EMA) and the use of wearable cameras ⁹⁶, which can be particularly useful to determine exposure of children to marketing tactics
- <u>Household analysis</u> which is a qualitative observational method to understand the relationship between household factors (e.g. cooking practices, purchasing patterns, food sources) and retail food environments, including how they change. This can be especially powerful for understanding the role that children play in food choices, and how they influence, and are influenced by, the retail food environment⁹⁷

4.4 Summary tools and methods for measuring retail food environments in EAP

Very little of the literature on the retail food environment landscape comes from EAP.

The tools available to assess retail food environments vary significantly in their purpose, approaches and feasibility. A highly targeted, mixed methods approach (i.e. using both quantitative and qualitative methods) that examine aspects of interest is likely to be the most useful, especially in examining informal retail food environments. Food environment measures need to be adapted to context and informed by the aim and objectives. Key considerations include:

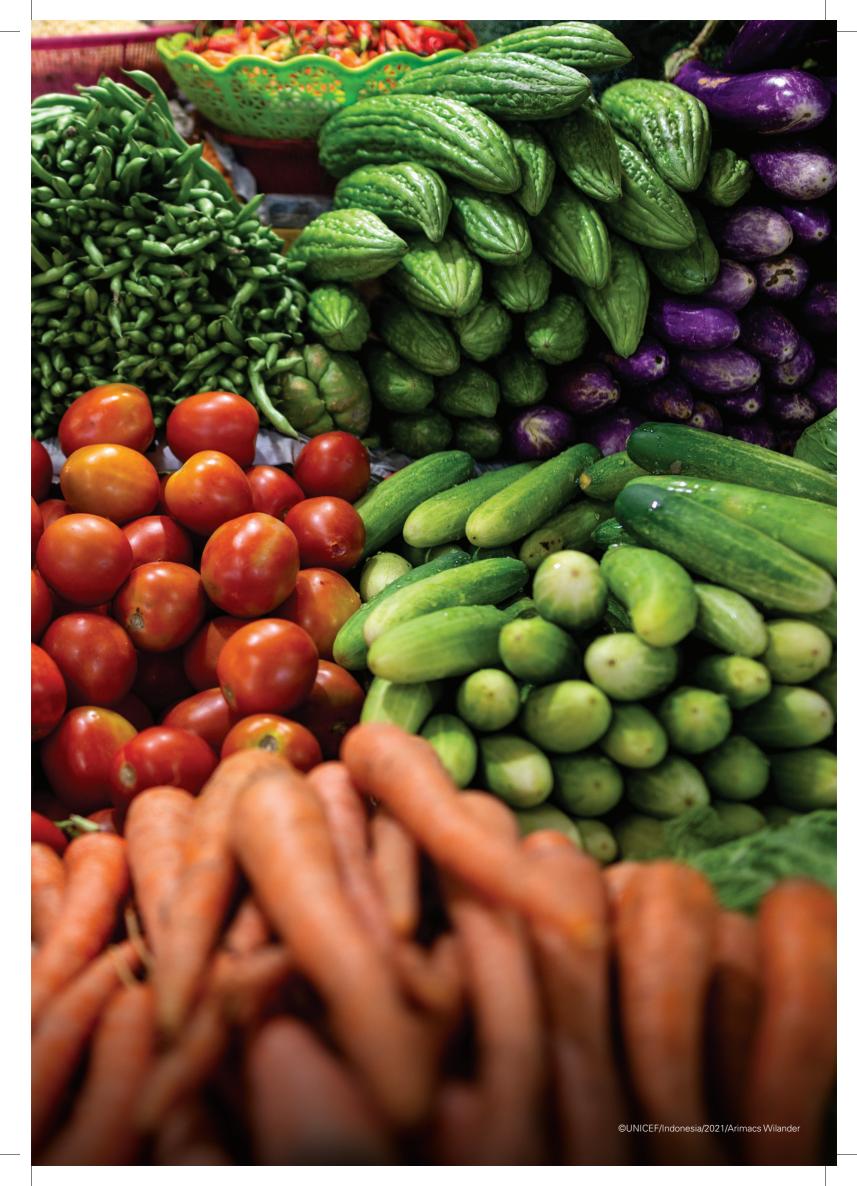
- the retail settings or geographical location of interest
- the food retail domain of most importance
- resources for data collection and analytical capacity

Examples of mixed methods approaches include combining birds-eye view approaches (GIS/commercial databases) with retail food environmental audits to demonstrate geographical access to food retail. Population surveys, household expenditure analyses, market surveys and 'on the-ground' observations can provide important understanding of the ways that retail food environments are used by different groups, and how different characteristics of retail food environments influence population diets.

Priorities for research in this area include:

Research priority*	Rationale
(short term) For a targeted set of countries, conduct an audit of existing data sources that could inform research into retail food environments, including from national level surveys, market basket surveys and aggregated data reports (including in relation to COVID-19)	Existing data sources represent an efficient means of gathering detailed data on food environments and how people use them. Useful for the identification of appropriate policy options, as well as for advocacy purposes
(short term) Investigate the potential to add EAP countries to the International Food Policy Study	The International Food Policy Study represents a low-cost opportunity to apply an existing, detailed questionnaire relating to food policy and related behaviours, to a large sample (adults and youth) from one or more countries in EAP. Allows for comparisons with other contexts (currently being utilised in 6 countries) and over time. A powerful tool for assessing the impact of changes in retail food environments over time, including as a result of policy change
(short term) Update and expand previous work mapping the growth of supermarkets and convenience stores in EAP countries	Important to identify countries undergoing food retail transition so that appropriate policy settings for emerging retail food environments can be put in place
(medium term) Develop composite measures (incorporating multiple characteristics of retail food environments, such as mix of foods available, food promotion, relative food prices, nutrition information) to describe the healthiness of: a) informal food retail settings; b) food courts/formal markets; c) shopping districts (e.g. shopping centres/suburbs)	A detailed understanding of retail food environments and how they differ across areas and countries is important for both identification of appropriate policy options, as well as for advocacy purposes. None currently exist
(medium term) Develop and adapt in-store audit tools to assess the availability and promotion of healthy and unhealthy foods in different retail settings (e.g. supermarkets, convenience stores, take-away food outlets), tailored to EAP contexts	A nuanced perspective on how individuals interact with their food environments is important to understand how policy options might impact different population groups (especially children) and is important for advocacy purposes
(medium term) Use qualitative methods to understand ways in which children are influenced by retail food environments, and how they impact food purchasing decisions	An important component of composite measures of retail food environments, and important in its own right for both identification of appropriate policy options, as well as for advocacy purposes. Many tools exist, some of which could be adapted to EAP settings
(longer term) Apply metrics/indexes for measuring food environments (both in-store and composite indices – see above), in a range of settings, and repeated over time	Applying tools in different settings and over time is important to understand change in retail food environments, and how they are responding to various initiatives, including policy change

*Short-term (pieces of work that can be completed in the next 6-12 months); Medium-term (projects that can be completed in the next 1-3 years); Longer-term (programs of work that can be carried out over the next 5 years)



Research testing interventions to promote healthy retail food environments

5.1 Existing evidence for healthy food retail interventions

A large number of interventions designed to improve the healthiness of retail food environments have been conducted internationally with multiple systematic reviews summarizing the data from different food retail settings⁹⁸⁻¹⁰³. The most common countries in which interventions have been conducted were the USA followed by The Netherlands, UK, Australia and Canada¹⁰². A systematic search (see details in Appendix 2) identified only four healthy food retail intervention studies conducted in EAP. These included one healthy supermarket intervention in the Marshall Islands^{104,105}, two studies in China that included a food retail component to their multi-sectoral interventions^{106,107} and one intervention targeting street foods in Indonesia¹⁰⁸ (described below).

Marshall Islands Healthy Stores Program^{104, 105}

The Healthy Stores Program was a multi-component intervention conducted in food stores in the Marshall Islands. The pilot trial involved 23 large and small food stores (12 intervention, 11 control) and developed intervention components in partnership with the retailers. The in-store intervention included cooking demonstrations, taste tests, shelf labels, posters and stocking healthier products. In addition, they also ran a media campaign across major channels (tv, radio, newspaper). The program was successful at increasing sales of targeted healthy foods as well as improving customer nutrition knowledge and food preparation behaviours.

China Shandong–Ministry of Health Action on Salt and Hypertension (SMASH) program¹⁰⁶

Retailers were involved in a government-led, multisectoral intervention to reduce sodium intake in Shandong Province,

China. Low-sodium food displays were present in 1461 supermarkets to promote awareness of sodium labelling. Salt reduction strategies were heavily promoted through major media channels as well as throughout the community, including in restaurants and cafeterias. The program led to a significant reduction in sodium intake. The role of the supermarket intervention component (low sodium food displays) was only briefly mentioned. The multi-sectoral nature of the program does not allow conclusions to be drawn from the effectiveness of the supermarket component beyond providing evidence of the feasibility to engage supermarkets in promoting healthy eating.

China Salt reduction RCT¹⁰⁷

Multi-component intervention to reduce sodium intake in a rural village. Intervention components included education, availability of a reduced sodium salt substitute at the village food store and coupons to subsidise the price. The intervention was effective in reducing sodium intake, primarily through increased consumption of the salt substitute.

Indonesia Mercy Corps and KeBal Healthy Food Carts: Sustaining and Scaling Up¹⁰⁸

The Kedai Balitaku (KeBal) or "My Child's Café" street food intervention in Indonesia involved the initiation of healthy food carts to sell food targeted for children under 5 years. Rather than work with existing vendors, this program created new opportunities for employment by creating a program that operated similar to a franchise. It included training for vendors in cooking, hygiene, nutrition and business skills, provided a KeBal branded cart and uniform, and a menu developed by nutritionists. The KeBal pilot intervention was successful with vendors reporting profitable sales and high customer satisfaction. The pilot study required funding and was not financially self-sustaining. It demonstrated consumer demand for healthy foods, particularly foods appropriate for children.

In addition to the interventions described above in EAP, among 282 studies included in the six most recent systematic reviews of interventions in restaurants, convenience stores and grocery stores/supermarkets⁹⁸⁻¹⁰³, the only intervention undertaken in any LMIC outside of EAP was a single study conducted in a university cafeteria in Peru¹⁰⁹.

Other relevant research from the region includes interventions from higher income countries, projects currently underway and research examining customer attitudes toward retail interventions. These are described below:

- **Singapore.** <u>Healthier Dining Program</u>, also known as Healthy Hawker Program which worked with street food vendors to improve the healthiness of their foods and beverages. The program encourages the use of healthier ingredients such as healthier oils and wholegrains, and reducing the energy, sugar and salt content of menu items. Participating vendors are eligible for financial rebates to assist with marketing costs of promoting healthier options
- Hong Kong. The EatSmart Restaurant Star is a three star rating scheme where: one star is a restaurant with at least 5 dishes with more fruit and vegetables and less fat, salt and sugar; and two stars is for offering special offers on EatSmart dishes (three stars not reported)⁷⁷
- Japan. Supermarket 60 day point-of-purchase health information intervention encouraging customers to
 purchase vegetables. Analysis based on point-of-sales system demonstrated increased vegetable sales¹¹⁰.
- **South Korea.** Healthy Restaurant Certificate, launched in 2005, includes voluntary nutrition labelling and healthy menus that meet nutrition standards. Participating restaurants receive marketing materials to promote them as a healthier restaurant (described in Seo 2017¹¹¹)

- **South Korea.** Educating restaurant owners and cooks to lower their own sodium intake is a potential strategy for reducing the sodium contents of restaurant foods: a small-scale pilot study¹¹²
- **South Korea.** Restaurateur's Willingness to Participate in the Healthy Restaurant Program in Seoul (only the abstract is in English)¹¹³. Half of respondents were willing to participate in a healthy restaurant program. Per Gittelsohn 2013 review¹¹⁴, this involved menu labelling and signage
- **Taiwan.** The application of traffic-light food labelling in a worksite canteen intervention in Taiwan. Customers reported the intervention was acceptable and reported sales of healthier foods increased¹¹⁵
- Mainland China. Action on Salt. Protocol paper outlines comprehensive salt reduction interventions targeting home cooking, packaged foods and restaurants. Restaurant interventions will include: "(1) a standardized environment encouraging consumers to order reduced-salt dishes, (2) reminders from waiters, and (3) training cooks to reduce salt use by 10% for all, and greater reduction per consumer requirements" ¹¹⁶
- **Malaysia.** The George Institute for Global Health is working in Malaysia as part of the Salt Reduction Strategy to monitor sodium levels of out-of-home dining meals and look for opportunities to work with vendors to improve the healthfulness of these foods similar to the approach taken in Singapore¹¹⁷
- Vietnam and Malaysia scoping studies about customer and restaurant operator's attitudes to menu labelling:
 - Socio-Economic Disparities in Attitude and Preference for Menu Labels among Vietnamese Restaurant Customers¹¹⁸
 - Restaurant operator's receptiveness towards providing nutritional information on menu¹¹⁹
- Thailand, Malaysia, Indonesia, Philippines. Project currently under way 'Obesogenic food environments and access to healthy food in four countries in South East Asia: identifying opportunities for strategic policy design to address the double burden of malnutrition.' Currently assessing food retail landscape in each country. Will also include INFORMAS food retail protocol, GroPromo tool, surveys of consumer demands and retailers' perception, and analysis of food retail policies in each country

5.2 Effectiveness of healthy food retail interventions

Systematic reviews^{98,99,102,103,120,121} have consistently found that the majority of food retail interventions designed to encourage healthy purchasing behaviours, across a range of settings, have had at least some positive impact on the healthiness of purchasing or consumption, although effect size is typically small and outcome measures vary widely. Educational interventions are reported as the most common type of intervention, with other interventions including manipulating price and product position or availability. Importantly, very few studies have involved interventions that discourage purchasing and consumption of unhealthy foods. Most studies have been reported as being of low to moderate quality, with most having one or more of a small sample size, short duration or poor study design. Importantly, we are not aware of any examples of food retail interventions implemented as part of research studies that have been scaled up in a sustainable way.

5.3 Considerations for study designs

It is important to understand the motivations of retailers when considering how to work with them and/or influence retail food environments. Four common factors that will motivate retailers to change^{122,123} include:

- 1. When change is good for business (profit)
- 2. When change is good for customer perceptions of the store or brand (which is ultimately good for profit)
- 3. When change is required because of competition
- 4. When change is not optional based on government laws (and regulation)

Ultimately, the feasibility and sustainability of changes to retail food environments depends heavily on these non-health-related outcomes ^{9,124}. In the short term, the most common challenge of working with retailers has been the identification of retail champions willing to be involved in research studies. In addition, the development of the trust between researchers and retailers required to do this research is both time consuming and challenging¹²⁵.

In the longer-term, initiatives that prioritise health without adequately considering business outcomes are less likely to be maintained. Accordingly, it is important that researchers aim for retail and health "win-wins" in the design, implementation, and evaluation of healthy food retail initiatives.

The effect of healthy food retail initiatives on business outcomes

A recent systematic review of business outcomes of healthy food retail initiatives by Blake et al. included 107 studies in grocery and food service settings.¹²³

The review found business outcomes (summarized in Appendix 2) were measured inconsistently, and rarely using validated tools. Overall item sales, revenue, store patronage, and customer level of satisfaction with strategy were the most frequently examined outcomes.

While most studies reported positive impacts on customer and retailer perceptions, commercial viability outcomes were less likely to be favourable (31% favourable, 18% unfavourable, 45% neutral). Favourable commercial outcomes were associated most with product-based initiatives such as increasing the proportion of food available that was classified as healthy. Findings were similar between food service and grocery settings.

The systematic review only included OECD countries but did include two studies from high-income South East Asian countries ^{111,126} that tested a placement-based nudge in a Japanese university cafeteria and a menu reformulation initiative in South Korea, respectively.

The business outcomes of Kedai Balitaku (KeBal), a healthy street cart program based in urban Jakarta, Indonesia¹⁰⁸ have also been reported in the grey literature. The initiative began in 2009 as a social enterprise with carts located predominantly in very low income areas, and selling and marketing food targeted at children such as vegetable and meat porridge, and fruit jellies. Vendors reported profit margin of 41-47% and gross profit of between 1.1-1.4 million IDR (equivalent to US\$115149) per month, but preparation of healthy food was noted to be highly laborious. High customer loyalty and satisfaction with food carts was reported. The evaluation noted retailers were exploring more sustainable business models for the initiative.

Consideration of business outcomes in retailer engagement

Given the lack of evidence with which to reassure retailers of positive business outcomes, initiatives should engage retailers at the design stage to help assess likely feasibility and sustainability ¹²⁷.

Collecting data on outcomes as the initiative progresses can build confidence in the absence of existing evidence¹²⁸.

Retailers may require external support to facilitate implementation, such as financial incentives to stock healthier items 9 and assistance in sourcing healthy product alternatives ¹²⁴.

Evidence gaps and research priorities in relation to business outcomes

Apart from the three initiatives mentioned above ^{108,111,126}, we are not aware of any other published studies investigating business outcomes of healthy food retail initiatives in the Asia-Pacific region.

Hypothetical or pre-intervention studies can be useful for exploring possible business-relevant outcomes ¹¹⁸, however real-world outcomes do not always align with consumer or retailer expectations.

Healthy food retail interventions in EAP should include evaluations of business outcomes as a priority. Researchers should consider the marginal costs associated with collecting and reporting additional outcomes within research datasets, for example using sales data to examine revenue or profit effects as well as healthiness of customer purchasing.

5.4 Summary – interventions to promote healthy retail food environments

Research testing interventions (or 'nudges') designed to encourage healthier retail food environments are an important way of demonstrating that they can be both good for public health and good for business. Demonstrations of success are an important way of encouraging other retailers to follow suit, especially when it is the retailer hailing the success of the intervention.

Although an increasing number of trials have been conducted across a range of retail types (including supermarkets, corner stores, remote stores, vending and restaurants), and the majority of these demonstrate some change toward healthier purchasing and/or consumption, very little research has been conducted in EAP, or in LMICs globally. Research that reports outcomes relevant to both health and business is recommended.

Research priorities that relate to retail food environment interventions include:

Research priority*	Rationale
(short term) Identify a range of in-store changes (particularly those likely to impact children) across different settings (e.g. supermarkets, convenience stores, take-away food outlets) that could be tested in the context of EAP, based on discussions with key informants, in-store audits and the results of trials elsewhere. Identify the appropriate study design and evaluation methods required for research testing these changes.	Identifying changes that are likely to be effective from a public health perspective and both feasible and sustainable from the retailer perspective is an important first step in the development of a research program of novel retail food environment interventions. Draws upon global evidence of best practice research in this area.
(short term) Identify retailer champions wishing to be involved in trials that might promote their business as a health promoting retail environment and consider business outcomes likely to be important to them	Corporate champions are an essential requirement for trials of healthy retail food environment nudges
(short term) Continue to develop best practice protocols and guidelines for engagement with retailers that considers and mitigates (as far as possible) the inevitable conflicts of interest that arise	Testing the effect of food retail interventions is crucial to develop the evidence for their effect on purchasing behaviour and on business relevant outcomes. Provides a proof of principle that can be adopted at scale, or incorporated into policy settings
(short term) Identify existing projects in the region and elsewhere that support retailers to implement best practice healthy food retail initiatives (in particular those likely to most impact children) and adapt these to the context of EAP	Builds on existing UNICEF project developing principles for engagement with (and on) businesses
(medium term) Utilise the network of academics, health promoters, policy makers and others (see recommendation in policies section) to promote and encourage the use of retailer support tools	Many tools currently exist that can help retailers to develop and evaluate healthy food retail initiatives. This project draws on best practice examples globally and applies these locally
(longer term) Conduct trials of interventions testing healthier nudges (including discouraging the purchasing and consumption of unhealthy foods) in EAP, with a view to scale up at a chain, national and regional level	Knowledge exchange, scale up of tools developed in project mentioned above

* Short-term (pieces of work that can be completed in the next 6-12 months); Medium-term (projects that can be completed in the next 1-3 years); Longer-term (programs of work that can be carried out over the next 5 years)

Building the evidence for policies that can improve the healthiness of retail food environments

6.1 Introduction

The economic, regulatory and political environment shapes the characteristics of retail food environments^{129,130}. Policies from multiple levels of government, as well as food industry policies and commitments, have an influence on the foods available for sale, the marketing of those products and their relative prices. As an example, at the international level, trade and investment policies influence the types of companies that operate in each country and the products available for sale. At the national level, policies on taxation, marketing and food labelling, amongst others, influence various characteristics of retail food environments¹²⁹. At the local level, policies in areas such as urban planning, food procurement, and food availability have all been shown to be important in shaping retail food environments^{16,129}. In addition, large food companies commonly make commitments related to nutrition practices (e.g. in the area of product reformulation and marketing to children). For children in particular, who are a vulnerable group that warrant societal protection, governments have a fundamental role in helping to make healthy choices the easy choices¹⁶. It is particularly important to note that successful policies require enforcement mechanisms, which can include monitoring of practices (see section 4.2.3) The key areas for policy action to influence retail food environments are discussed in this section.

6.2 National and state government policies for healthier retail food environments

At the national and state government level, there has been very little policy action designed to encourage healthy retail food environments. However, some best practice policy examples have recently been adopted in diverse settings that include LMICs. Some of these best practice policy examples include:

LMICs:

 In September 2020, India has introduced a ban on the sale, advertisement and promotion of all foods high in saturated fat or trans-fat or added sugar or sodium (high in fat, sugar, sodium foods) within 50 metres from the school grounds (as well as in school grounds) • A number of states in Mexico have in 2020 <u>banned the sale</u> of sugar-sweetened beverages and highly processed foods to anyone under 18

High income countries:

- The UK government has committed to legislative ban on ^{131,132} unhealthy food price promotions. Specifically, this includes a restriction on multi-buys (buy-one-get-one-free), sale of unhealthy foods at check-outs and at shop entrances and on the sale of unlimited refills of unhealthy foods and beverages in places where they are sold to the public. This is the first policy addressing unhealthy food price promotions to have appeared on a national policy agenda
- In 2019, the UK government announced it would <u>ban sales of energy drinks to those under 16</u> years. While a number of major retailers had already banned the sale of energy drinks to children, it had not been a legal requirement and energy drinks remain readily available from other retailers, convenience stores and vending machines
- A recent review of the impact of menu labelling policies on transnational restaurant chains found 8 countries with mandatory policies at the state/province and/or national level, including none in LMICs, and two in Asia (South Korea, Taiwan). Evaluations of policies were from 15 published articles, 11 from the USA and Canada, two from Europe and two from Australia. In the USA only, menu labelling policies were shown to result in newly introduced items having between -57 to -285 fewer calories/item compared to existing items¹³³

As part of INFORMAS, the Healthy Food Environment Policy Index (or Food-EPI) protocol is designed for countries to comprehensively examine government policies for improving food environments, including policies related to food retail, and highlight priority areas for action. The Food-EPI tool can be used to increase accountability for policy action in relation to food environments. The protocol has been applied in multiple countries at the national level¹³⁴, including in Thailand¹³⁵, Malaysia¹³⁶ and Singapore¹³⁷.

Of relevance to food policy in the Pacific, a <u>recently announced project</u> aims to produce local context-specific evidence for the impact and cost-effectiveness of food policy interventions to improve diets in the Pacific Islands (Fiji and Samoa). It also aims to produce new insights into what is feasible and which factors contribute most to effective implementation in different contexts

6.3 Local government / city-level policies for healthier retail food environments

Local authorities (i.e., municipal or local councils) have the opportunity to serve as catalysts of change, and have the power and mandate to put in place local or urban policies that have direct impact on the health and wellbeing of local communities. In recent years, many cities have <u>adopted and implemented local policies and initiatives</u> aimed at improving the healthiness of food environments in their respective areas of jurisdiction. These policy actions cover a wide range of focus areas, including imposing taxes on unhealthy food and beverages, regulating the marketing of unhealthy food and beverages, and increasing the availability and accessibility of healthy food and beverages. Key examples of cities that have acted on overweight and obesity are <u>Amsterdam</u>, <u>New York</u> and <u>London</u>. In relation to retail food environments, in 2020, the city of Berkeley in California became the first in the world to <u>ban unhealthy food at checkouts</u>. The new law will require stores over 2,500-square feet to "<u>sell more nutritious food and beverage options in their checkout areas</u>."There are limited similar examples from LMICs.

Several global initiatives have been developed to support cities in implementing healthy and sustainable food systems and policies with the most prominent being:

- <u>Milan Urban Food Policy Pact</u> (MUFPP): The Milan Urban Food Policy Pact (MUFPP) was established in 2005. It is an agreement among mayors to work on food policies to develop more sustainable food systems in their cities. By 2020, it has 207 signatory cities, including several in EAP
- FAO and RUAF Foundation's <u>City Region Food System (CFRS) Toolkit</u>: Developed to assist cities in assessing the status and performance of their food systems through a systems-approach. 12 pilot cities included to date, mostly from LMICs, none in EAP
- <u>C40 Food Systems network</u>. Part of the C40 network of the world's megacities committed to addressing climate change and building from the MUFPP. In partnership with the EAT initiative, it includes 54 signatory cities (including Jakarta, Wuhan, Singapore and Hong Kong) and focuses on food procurement, the food environment (including retail), food waste, regenerative agriculture and governance
- In addition, the <u>WHO 'Healthy Cities' programme</u>, developed by the WHO and launched in 1986, aims to improve the health and wellbeing of people working and living in cities

6.4 Food industry self-regulation

There are numerous examples of industry self-regulation related to nutrition¹³⁸. There are also several initiatives that monitor and assess the policies and actions of the food industry related to nutrition. A prominent example is the <u>Access to Nutrition Initiative</u> (ATNI) that benchmarks large food and beverage manufacturers on their obesityand undernutrition-related commitments, practices and product portfolios. The ATNI has launched three global indexes (2013, 2016, 2018), and a small number of spotlight indices (e.g. in the U.S. and India).

Of relevance to EAP, the BIA-Obesity tool¹³⁸, developed by INFORMAS for assessment of the commitments of food companies to improving population nutrition was recently applied in Malaysia, with the 33 companies assessed receiving an average score of 11% for their commitments¹³⁹. The conclusion was that "commitments of companies were generally vague and non-specific.

Indeed, a review of literature in this area concluded that overall "industry self-regulation and voluntary agreements or partnerships between government and industry have repeatedly been shown to be ineffective public health policy mechanisms" ¹⁴⁰. The primary reasons cited for failure of industry self-regulation include:

- commitments are vague, and focused on education and information for consumers
- limited monitoring and reporting
- voluntary participation, which means not all relevant parties are involved

In relation to the UK, it was also noted that "retailers and manufacturers have been asking for stronger measures from government to achieve "a level playing field" and avoid a "piecemeal response from business" ¹⁴¹.

In the absence of strong government regulation, missing an accountability framework, such as provided by the BIA-Obesity, is essential to monitor and benchmark company action to improve population nutrition¹³⁹.

6.5 Summary – policies related to retail food environments

Outside of menu labelling, it is only very recently that best practice policies designed to encourage healthy retail food environments have been successfully adopted, in diverse settings that include LMICs. This represents a powerful precedent and a strong argument can be made that governments have a responsibility to utilise policy options to protect the future health of children in particular¹⁶.

Key focus areas for research to support policies related to retail food environments include:

Research priority*	Rationale
(short term) Build an alliance of policy makers, academics and others interested in encouraging healthier retail food environments in the region, including engagement with existing city-level food system initiatives (e.g. C40 and Milan Urban Food Policy Pact) to scope opportunities to prioritise healthy retail food environments as part of their programs of work. Could involve an ongoing series of webinars, as well as online networking and a web presence	Identifies the lowest hanging fruit. Focuses on the future retail food environment, which is likely most able to be influenced
(short term) For a targeted set of countries, identify the types of local evidence required to support adoption and implementation of promising policy options relating to retail food environments	Helps to build momentum for change, and to ensure that initiatives are co-ordinated, and a best-practice culture of ongoing learning exists, including from experts in the area
(medium term) Commission studies to generate evidence to support adoption and implementation of promising policy options identified above	If a country and policy can be identified that was at a late stage of readiness to change, this could serve as a test case for other countries in the region
(medium term) Develop indicators for benchmarking local-level actions for improving the healthiness of retail food environments, including benchmarks of best practice	Indicators help focus on where action is needed, and brings together best practice recommendations into actionable steps
(longer term) Accountability for action: Development and implementation of accountability mechanisms for improving the healthiness of retail food environments. These mechanisms should be embedded as part of broader initiatives (e.g. INFORMAS, ATNI). Accountability processes should include routine benchmarking of policies and practices of local and national governments, as well as leading retailers and manufacturers	Keeps governments and food industry accountable for commitments and encourages new commitments, and serves as a powerful advocacy tool. Encourages a standardised approach. Food-EPI tool has been used successfully in several countries
(longer term) Evaluation of any new policies implemented, using indicators developed as part of previous projects	Evaluation of any new policies is important to ensure they are effective, and to advocate against mis-information from the food industry

* Short-term (pieces of work that can be completed in the next 6-12 months); Medium-term (projects that can be completed in the next 1-3 years); Longer-term (programs of work that can be carried out over the next 5 years)

Covid-19 considerations

Given the impact of the COVID-19 pandemic on food systems globally, and in particular on how people shop, the short and longer-term impacts need to be considered in any research agenda. The importance of a stable, safe, affordable, sustainable and healthy food supply has <u>never been more apparent</u>. Impacts of COVID-19 include:

- An increase in the speed of transition toward online shopping both groceries and meal delivery (per <u>Asia Pacific Food Industry</u> and <u>Nielsen</u>) and an increased interest in, and spending on, health and nutrition (per <u>Asia Pacific Food Industry</u> and <u>Food & Beverage Industry News</u>)
- Economic impacts and subsequent job losses are likely to increase demand for low cost foods
- After previous economic crises, the number of street vendors operating has increased^{142.} In the current pandemic, however, due to lockdown restrictions and concerns about infection risk, people are more often staying indoors and not going to work, as well as reduced tourism, has led to <u>reduced foot traffic and opportunities for street food vendors</u>
- Increased concern about infection risk and hygiene practices of vendors may drive consumers toward packaged food and retailers who are perceived as having <u>safer hygiene practices</u>¹⁴³ Some lockdowns have forced the <u>closure of informal vending</u> such as street markets, further increasing the popularity of supermarkets
- Tools are already being developed for evaluating effects of the COVID-19 pandemic on food system resilience¹⁴⁴



Equity considerations

When mapping and describing retail food environments it will be important to disaggregate data by equity-relevant indicators (e.g. location of fast-food outlets in low and high income neighbourhoods; number and type of food outlets around schools considered to be of low or high socioeconomic disadvantage). Similarly, when working with retailers to develop interventions it will be important that the type and location of food retailers reflect food environments visited by lowand high-income shoppers. Interventions that focus on structural change to the retail food environment to support healthy food purchases are likely to be more equitable than interventions that rely on individual agency, such as education and information based strategies, in food retail stores¹⁴⁵. Lastly, this briefing paper focuses on the urban retail food environment, however it is acknowledged that retail food environments and the procurement of foods differs in urban and regional or remote areas of EAP. Implications for scale-up of retailer-led interventions across non-urban areas should be considered. Government-led regulation is likely will cover all geographical locations and should also be prioritised.

Summary of research priorities

Based on available literature and the expert knowledge of the authors regarding their likely impact, feasibility, cost, and relevance to the agenda of UNICEF, a number of research priorities have been identified that will help UNICEF improve the healthiness of urban retail food environments in EAP. The priorities identified below incorporate research targeting a diverse range of retail food environments, and incorporate multiple mechanisms drawn from each of the focus areas of this report.

Research recommendations have been divided into: i. Short-term (pieces of work that can be completed in the next 6-12 months); ii. Medium-term (projects that can be completed in the next 1-3 years); and iii. Longer-term (programs of work that can be carried out over the next 5 years) projects.

The next phase of this work is to share these priorities via an expert webinar and further evolve these into a plan of action.

Mapping, describing, and understanding retail food environments	Policies related to retail food environments	Testing interventions to promote healthy retail food environments
(short term) For a targeted set of countries, conduct an audit of existing data sources that could inform research into retail food environments, including from national level surveys, market basket surveys and aggregated data reports (including in relation to COVID-19)	(short term) Build an alliance of policy makers, academics and others interested in encouraging healthier retail food environments in the region, including engagement with existing city-level food system initiatives. Could involve an ongoing series of webinars, as well as online networking and a web presence	(short term) Identify a range of in-store changes (particularly those most likely to impact children) across different settings (e.g. supermarkets, convenience stores, take-aways) that could be tested in the context of EAP, based on discussions with key informants, in-store audits, proposed policies and the results of trials elsewhere. Identify the appropriate study design and evaluation methods required for research testing these changes.
(short term) Investigate the potential to add EAP countries to the International Food Policy Study, an annual surveys of ~4000 participants in each of 6 countries on topics related to food policy and population diets, allowing for direct comparisons over time and across countries. Includes a youth survey	(short term) For a targeted set of countries, identify the types of local evidence required to support adoption and implementation of promising policy options relating to retail food environments (particularly those most likely to impact children)	(short term) Identify retailer champions wishing to be involved in trials that might promote their business as a health promoting retail environment and consider business outcomes likely to be important to them
(short term) Using available aggregated data sources, update and expand previous work mapping the growth of supermarkets and convenience stores in EAP countries	(medium term) Commission studies to generate evidence to support adoption and implementation of promising policy options identified above	(short term) Continue to develop best practice protocols and guidelines for engagement with retailers that considers and mitigates (as far as possible) the inevitable conflicts of interest that arise
(medium term) Develop composite measures (incorporating elements such as: food availability, price, promotion and placement, nutrition information) to describe the healthiness of: a) informal food retail; b) food courts/formal markets; c) shopping districts (e.g. shopping centres/suburbs)	(medium term) Develop indicators for benchmarking local- level actions for improving the healthiness of retail food environments, including benchmarks of best practice	(short term) Identify existing projects in the region and elsewhere that support retailers to implement best practice healthy food retail initiatives (particularly those most likely to impact children) and adapt these to the context of EAP
(medium term) Use qualitative methods to understand ways in which children (and their caregivers) are influenced by retail food environments, and how they impact food purchasing decisions	(longer term) Development and implementation of accountability mechanisms for improving the healthiness of retail food environments. These should be embedded as part of broader initiatives (e.g. INFORMAS, ATNI) and include routine benchmarking of policies and practices of governments (local/national), retailers and manufacturers	(medium term) Utilise the network of academics, health promoters, policy makers and others (see recommendation in policies section) to promote and encourage the use of retailer support tools
(medium term) Develop and adapt in-store audit tools to assess the availability and promotion of healthy and unhealthy foods in different retail settings (e.g. supermarkets, convenience stores, take-away food outlets), tailored to EAP contexts	(longer term) Evaluation of any new policies implemented, using indicators developed as part of previous projects	(longer term) Conduct trials of interventions testing healthier nudges (including discouraging the purchasing and consumption of unhealthy foods) in EAP, with a view to scale up at a chain, national and regional level
(longer term) Apply metrics/indexes for measuring food environments (both in-store and composite indices – see above), in a range of settings, and repeated over time		

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Appendix 1 Approaches to the assessment of retail food environments

Methods:

We undertook a rapid review of the tools and methods applied to reflect the retail food environment. To limit the search in scope we only searched one database: PubMed Medline. Keywords used in the search were those pertaining to the food environment ('food environment', 'nutrition environment' or 'diet'), food retail ('food outlet', 'food store', 'grocery store', 'supermarket', 'convenience store', 'fast food', 'restaurant', 'takeaway', 'access*', 'availability' or 'affordability') and measures ('measure*', 'instrument', 'tool' or 'assess*'). These terms were selected to align with previous reviews on this topic ^{69,78,146,147} and to restrict the size of the sear to align with rapid nature of this review.

One author screened all titles and abstracts to find relevant articles. That same author conducted a rapid screen of all relevant full text articles to i) identify key research methods and tools that had been identified for use in measuring the retail food environment, ii) identify key review articles for cross checking with the final results, and iii) to identify any additional articles for exclusion. Key characteristics of food environment measures that were extracted included; a description of the method; the analytical potential of the method; the typology of the retail food environment assessed (e.g. formal or informal); the retail food environment domains assessed (e.g. proximity, availability, healthfulness); the potential limitations of the methods; the potential advantages of the methods, and; the potential policy implications of the methods.

The search returned a total of 9798 results, of which 18 were duplicates, leaving 9780 unique search results. 9524 of these were excluded after title and abstract screening, leaving 256 full text articles. An additional 5 articles were excluded after reading their full text and so 251 articles were rapidly screened to determine the relevance of their tools and methods for assessing the retail food environment.

A summary of the available approaches to the assessment of retail food environments is presented in <u>Appendix</u> <u>Table 1</u>.

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Data source	Type of measure	Description of the source	Analytical potential	Retail food environment assessed	Food environment domains represented	Methodological limitations	Methodological advantages	Methodological and political considerations
	Observational or individual	Where is it, how is it collected, what does it collect	What can be done with the data?		E.g. proximity, density, affordability, availability, healthfulness, marketing			
Observational approaches	roaches							
Geographical Information Systems (GIS)	Observational (geospatial)	Geocoded food outlet data is analysed against an address model (e.g. neighbourhood or population networks) based on a metric (e.g. proximity, density, buffer size)	Commonly used to assess proximity and density of different types of registered food outlets	Formal	Proximity, density, exposure	 Heterogeneity in methods Resource are required to establish the method Additional data is required to establish the method Use of retail Use of retail classifications (store type) as a proxy for healthfulness can be inaccurate Exposure proxies may underestimate Exposure to children Ignores the ways that people actually use the environment 	 Efficient Previously validated by environmental surveys Measures proximity and density of outlets Objective measure 	 Accepted use of GIS by government increases policy relevance GIS is reliant on registration of business so cannot be used to measure the informal retail food environment
Global Positioning Systems (GPS)	Observational (geospatial)	GPS is a satellite- based global navigation system that provides an accurate location of any point on the Earth's surface. Commonly, participants are given GPS devices so that their movements (and exposure to the retail food environment) can be tracked.	•Can be used to map the retail food environment and locations of specific outlets. •Can be used to examine exposure of individuals (pedestrians) to food outlets within a given space.	Formal	Proximity, exposure, density	 Parameters, classifications and methods need to be established May be subject to positional inaccuracy depending on technology depending on technology Requires training in GPS use and data cleaning. Use of retail Use anoty for healthfulnes can be inaccurate GPS devices measure only where people have been, not what they use/notice 	 Can be used to assess individual's exposure to the retail food environment Useful for examining children's exposures Relatively accurate May be paired with other methods (e.g. surveys) to methods (e.g. surveys) to methods (e.g. surveys) to methods leg surveys) to methods end surveys to method accurate at measuring individual's routes (and subsequently exposure) than GIS-based modelling 	 Can be useful in mapping child exposures Often costly to conduct

Data source	Type of measure	Description of the source	Analytical potential	Retail food environment assessed	Food environment domains represented	Methodological limitations	Methodological advantages	Methodological and political considerations
	Observational	A range of surveys exist that aim to audit the retail food environment. Surveys are normally conducted on a store-by-store basis. Used for routine monitoring, benchmarking of systems. A repository of 367 (mostly US) tools for measuring food environments is available here from the US National Collaborative on Childhood Obesity Research (NCCOR)	Measures include availability of healthy meals and products, facilitators of healthy eating, barriers to healthy eating, pricing of healthy and unhealthy options, and non-menu marketing	Any (specific tools target individual food environments – e.g. corner stores, grocery stores, restaurants, vending)	Many surveys measure: Availability, variety, healthfulness, quality, prices, promotion, shelf space, access Some surveys additionally or alternatively measure: Proximity, density, store physical characteristics, store social characteristics	 Resource intensive to develop appropriate context specific tools, train auditors and conduct audin audits any substance of the limited by logistic considerations Most tools are quite context specific and often only measure availability and price of specific products (e.g. NEMS-S) marketing or promotion, often not assessed often not assessed Most tools do not assessed 	 Only way of assessing the healthiness of the food environment in-store arketing and promotion Can assess differences between chains between chains can explicitly of environment retail food environment and be adapted to specific contexts Methods capture a range of food environment domains and characteristics Many surveys have been validated 	 Given the limits of how much data can be collected using an observational tool, using food audits in conjunction with other research methods (e.g., focus groups, participant observation, in-depth interviews) is recommended. Particularly useful for monitoring purposes (e.g. compliance to regulations)
	Observational	Market basket measures monitor the availability, price and/ or purchase of foods that are typically considered to fall within a 'healthy' and 'unhealthy' diet (or 'market basket').	Can assess availability and consumption of a range of foods included in a 'healthy' and 'unhealthy' diet	Any	Affordability, availability, healthfulness, variety	 Requires development Detailed nutrient assessment to identify foods for inclusion Requires complimentary information from other surveys 	 Can incorporate cultural considerations Can incorporate a range of aspects of the food environment (types of foods, healthfulness of foods, healthfulness of foods) Somewhat time efficient as fewer foods are required to be assessed required to be assessed environmental surveys Highly context specific 	

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Methodological and political considerations			
Methodological advantages	 Not subject to recall bias Consistently reported across countries Measures availability of food products and outlets Measures purchase of ingredients and nutrients and well as final products 		 Often frequently reported Can be used as proxy for food access and security
Methodological limitations	 Data is only available at the national level Only approximated data is available for many countries, which has been labelled inaccurate Data does not capture products sold through informal markets, or food wastage Data has not been validated Data must be purchased, but some Universities do have access 		 Limited food commodities are captured Does not list where food purchases were made
Food environment domains represented	Availability, healthfuiness, market share	Farmers' market access, food variety	Price
Retail food environment assessed	Formal markets		Countries adopt their own standard methodology and so may capture a range of retail food environment typologies
Analytical potential	Can assess the availability and purchase of a complete range of food products, and assess food expenditure at retail and food service outlets, annually and by country, prospectively and modelled for the next 5 years.	Can be used to examine informal market access	Can track price of 20-50 marker goods to track affordability and inflation of essential foods
Description of the source	Euromonitor food and beverage sales data for the 80 largest country markets is collected from a number of sources including trade associations, industry bodies, business press, company financial reports, company filings, and official government statistics. For the remaining 130 countries, modelled data is generated through a model that allocates each included country a researched	National survey undertaken by Government statistics divisions, collecting information on farming practice, agricultural holdings, crop availability and land use and potentially access to markets	Routinely conducted in some countries to measure the change in the cost of purchasing a given "basket" of consumption goods and services for the information of CPI.
Type of measure	Observational	Observational	Observational
Data source	Aggregate food supply data	Agricultural census or similar	Consumer Price Index (PP) Market surveys

Data source	Type of measure	Description of the source	Analytical potential	Retail food environment assessed	Food environment domains represented	Methodological limitations	Methodological advantages	Methodological and political considerations
Individual approaches	hes							
Customer surveys	Individual	Customer surveys conducted in retail environments use predefined questions to ask customers about the retail food environment	Can be used to test any domain as related to any retail food environment typology	Any	Any	 Resource intensive Surveys may require development and validation Recruitment methods may result in participant bias or under-representation Subjective data Unreliable when compared with objective measures of the retail food environment 	 Some pre-existing surveys have been validated Can address any element of the food environment, including informal outlets 	
Customer interviews	Individual	Customers are recruited to participate in interviews or focus groups to discuss perceptions of the retail food environment	Can provide in-depth qualitative data on any aspect of the retail food environment	Any	Any	 Resource intensive May require training for data-collector Recruitment methods may result in participant bias or under-representation Highly subjective data 	 Provides in-depth data on individual or group perceptions Minimal additional equipment required Can address any element of the food environment, including informal outlets 	
Vendor surveys	Individual	Vendor surveys conducted in retail environments use predefined questions to ask vendors about the retail food environment	Can be used to test any domain as related to any retail food environment typology	Any	Any	 Resource intensive Surveys may require development and validation Recruitment methods may result in participant bias or under-representation Subjective data Uhneliable when compared with objective measures of the retail food environment 	 Some pre-existing surveys have been validated Can address any element of the food environment, including informal outlets 	
Vendor interviews	Individual	Food outlet vendors are recruited to participate in interviews or focus groups to discuss vendors' perceptions of the retail food environment	Can provide in-depth qualitative data on any aspect of the retail food environment. Have previously been used to assess the informal retail food environment	Any	Any	 Resource intensive May require training for data-collector Recruitment methods may result in participant bias or under-representation Highly subjective data 	 Provides in-depth data on individual or group perceptions Minimal additional equipment required Can address any element of the food environment, including informal outlets 	

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Data source	Type of measure	Description of the source	Analytical potential	Retail food environment assessed	Food environment domains represented	Methodological limitations	Methodological advantages	Methodological and political considerations
Visual methods	Individual	Includes photography, mobile phone visual ethnography, mapping, drawing etc. Examples include ecological momentary analysis (EMA) using mobile applications (regular prompts to record information about the environment), and wearable cameras with regular photos that capture interactions with food environments	Can be used to assess community members' perceptions of, and use of, food environments	Any	Any	 Subjective Small sample sizes Apps may require development Potential to be costly Requires significant early-stage input 	Analysis of images can be resource intensive and/or technologically challenging less resource intensive post-development stage oost-development stage community perceptions in a less invasive way	
Direct observation	Individual	Learning from local anthropologists who understand the food and retail cultures well	In depth understanding of existing food systems and how they have changed over time, as well as how they are used by communities	Any	AI	 Intensive data collection means small sample sizes Potentially unrepresentative samples Requires skilled and knowledgeable qualitative researchers Subjective data 	 Real-life knowledge of how and why different groups of people interact with their food environment and how that changed over time or inter-generationally 	Can be especially powerful for understanding the role that children play in food choices, and how they influence, and are influenced by, the retail food environment
Nielsen consumer panels	Individual	Nielsen consumer panel data provides information on household food and beverage purchases. Panel participants scan purchases made from a variety of food retail outlets using handheld scanner devices. Data is available for 25 countries.	Can assess the availability and purchase of a complete range of food products, including price promotions.	Formal markets	Availability, healthfulness	 Data is only available at the national level Data does not capture products sold through informal markets, or food wastage Data is extremely costly to acquire Potentially Potentially in low-income countries (panels more likely to include higher educated sample) 	 Consumer panel data is likely to be more accurate than modelled data Has data for specific products and product categories Data is comparable between countries Demographic and other data available on participating individuals 	

Data source	Type of measure	Description of the source		Retail food environment assessed	Food environment domains represented	Methodological limitations	Methodological advantages	Methodological and political considerations
Indiv	Individual	Household Income Expenditure Surveys are national government surveys undertaken 'routinely' in 95% of all countries. Includes a measure of food acquisition or dietary recall, breaking products down by purchased, 'gifted' or 'home produced'	Can be used to examine the number and percentage of households that types of foods, by household characteristics. Can provide food acquisition data (quantity and value) at individual or household level or by geographic area	Purchased or acquired food products from any sources, with potential for governments to add additional measures	Availability, affordability, preference, healthfulness	 Cannot provide information on specific retail settings by current disaggregation Data is self-reported and may overestimate or underestimate food purchases Relies on interpretation of food classification across 75-500 food items 	 Census sized sample Data is routinely collected in many countries May detect subnational variations in consumption patterns Can provide information on prices of food and beverage products 	Surveys would likely need additional variables added. At the moment, most are disaggregated to 'purchased'
Indiv	hadividual	National nutrition surveys are undertaken in many countries, and many include a measure of dietary intake	Can be used to examine the number and percentage of households that purchase particular types of foods, by household characteristics	Purchased or acquired food products from any sources	Preference, healthfulness	 Current disaggregation cannot provide information on specific retail settings Data is self-reported and may overestimate or underestimate food purchases Relies on interpretation of food classification across 75-500 food items Demographic and other information available on participants 	 Census sized sample Data is routinely collected in many countries May detect submational variations in consumption patterns Can provide information on prices of food and beverage products 	Potential to disaggregate

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Appendix 2 Methods used for literature search of healthy food retail interventions in the East Asia and Pacific Region

A systematic literature search and a search of the grey literature were undertaken to identify healthy food retail intervention studies undertaken in EAP. In addition, review articles identified in a <u>systematic review of food retail</u> <u>reviews</u> currently being undertaken by the authors were also screened for relevant references.

A total of 936 articles were screened in the systematic search, among which two healthy food retail interventions were identified from EAP. Screening the reference list from key articles and literature reviews revealed one additional intervention and the grey literature search also identified one intervention.

A search was conducted of the MEDLINE Complete database via EBSCOhost to identify healthy food retail interventions in EAP. Search terms (described below in <u>Appendix Table 2a</u>) were identified based on other systematic reviews the research team is conducting. The search was targeted to identify interventions in the East Asia and Pacific Region. Limits included articles in English only and published since 2000 (as most food retail research has occurred in the past two decades). The reference lists from key articles were also screened and additional papers already identified by the research team were added. In addition, review articles identified in a related <u>systematic review of food retail reviews</u> currently being undertaken by the authors were also screened for relevant references. The search terms for this systematic review are also described below in <u>Appendix Table 2b</u>. The included articles were screened to identify any additional interventions in the East Asia and Pacific Region. This review also allowed the identification of interventions conducted elsewhere in the world that may be transferrable to the region.

A grey literature search was conducted using Google search with terms related to healthy food retail in East Asia-Pacific. Relevant websites were also searched, including the NYC Food Policy Center, Euromonitor and the WHO.

Appendix Table 2a: Search terms for East Asia-Pacific healthy food retail interventions

Limits	Food retail outlet (type/ setting)	Region	Healthy food	Intervention
English articles only	"Food retail*" or supermarket* or hypermarket* or grocer* or market* or "convenience store" or "food store" or "corner store" "food outlet*" or kiosk* or bodega* or cafe* takeaway or "take-away" "fast food" or "street food" or hawker or "food outlet*" or restaurant* or "food deliver*" or "home deliver*" or "street vendor*" or "vending machine*" or "automatic food dispenser*" or "Retail food environment*" or "ready to eat"	"Low* and mid* income countr*" or LMIC or "Iow income countr*" or "mid* income countr*" or "developing countr*" or Asia or "Asia Pacific" or China or Indonesia or Malaysia or Mongolia or Myanmar or Philippines or Thailand or Vietnam or "Pacific Island*" or "the Pacific" or Fiji or Kiribati or "Marshall Islands" or Micronesia or Nauru or Palau or Samoa or "Solomon Islands" or Tonga or Tuvalu or Vanuatu or "Papua New Guinea"	"Health* food" or nutrit* or diet* or obes* or weight or food or beverage or healthy	Intervention or evaluat* or policy or policies or legislat* or regulat* or "health promot*" or prevent*

Appendix Table 2b: Search terms for Factors influencing implementation, sustainability and scalability of interventions implemented by food retailers to improve the healthiness of food purchased by consumers: A systematic review of reviews

Limits	Food retail outlet (type/ setting)	Intervention foci	Outcomes
English Reviews only	"food industry" OR bodega* OR "corner store" OR "convenience store" OR "grocery store" OR diner* OR grocer* OR vending machine* OR "automatic food dispenser*" OR "fast food*" OR "take away" OR "dining room*" OR cafeteria* OR catering OR cafe* OR "ready to eat" OR food* OR beverage* OR drink* OR dispenser* OR supermarket* OR restaurant* OR shop* OR retail* OR store* OR "food environment" OR "food outlet*" OR "home delivery" OR ((Hospital OR college* OR school* OR university* OR education* OR office* OR store OR "sport centre"* OR "petrol station") n/3 (food* OR drink* OR beverage* OR snack*))	product OR place* OR profile OR portion* OR pric* OR promotion OR priming OR prompt* OR proximity OR availability OR discount* OR voucher* OR incentive* OR bonus* OR reward* OR coupon* OR token* OR rebate* OR refund* OR access* OR display OR remov* OR layout OR strateg* OR advert* OR market* OR activit* OR initiative* OR program* OR "food quality" OR reformula* OR modif* OR adapt* OR recipe* OR product* OR "Point of purchase" OR "Point of sale"	implement* OR sustain* OR Scal* OR Engag* OR feasibil* OR "cost-benefit" OR "cost effective*" OR Fidelity OR Adoption OR retention OR accept* OR intervention* OR evaluat* OR "food choice" OR purchas*

Appendix Table 3 Summary of business outcome concepts and measures for working with retailers

Source: Blake, M. R., Backholer, K., Lancsar, E., Boelsen-Robinson, T., Mah, C., Brimblecombe, J., et al. (2019). Investigating business outcomes of healthy food retail strategies: a systematic scoping review.

Term	Scope	Definitions and examples of measures ^a	Data collection methods ^b
Commercial viability	Total sales	Total number or volume of food and beverage items sold.	Electronic sales data, sales receipt data, customer loyalty cards.
	Revenue	Total income.	
	Profitability	Revenue minus expenditure; or profit margins.	
	Wastage	Plate waste in cafeterias; or discarded products due to expiry in stores. (NB: Emergent outcome)	Weighed plate waste.
	Time and/or cost associated with implementation and maintenance	Upfront and ongoing infrastructure or equipment costs; staffing costs; or cost of changing suppliers.	Contract documents, billing receipts, work plan s, wholesale cost of ingredients/ stock, staffing costs; Qualitative interviews with retailers.
	Return on investment	Return on investment for retailer, e.g. monetary investment per 100 items sold (does not include 'health-based' cost benefits); or cost-benefit analysis.	ReturnElectronic sales data; InvestmentAs above for time/ cost measures.
	Competitiveness	Providing point-of-difference compared to other similar retailers.	Qualitative interviews with store managers/ owners.
	Value creation	Whether retailers consider the strategy adds value to their business, e.g. is attractive to customers.	
	Opportunity costs	"Opportunities foregone at the time an asset or resource is used" ^c e.g. Retailer discussion of other lines or projects that were displaced due to healthy food strategy.	
	Attitudes of business stakeholders	Attitudes of stakeholders including staff, suppliers, industry organisations.	Qualitative interviews with store managers/ owners/ stakeholders.
	Store patronage	Foot-traffic; or frequency of customer purchases; or customer loyalty to store; or number of transactions	Electronic sales data; door counters.
	Spend per transaction	Revenue per customer transaction. (NB: Emergent outcome)	Electronic sales data; sales receipts from customer surveys; loyalty card data.

Term	Scope	Definitions and examples of measures ^a	Data collection methods ^b
Retailer perceptions	Retail staff personal satisfaction level	Impact on the retail staff or their friends or family's wellbeing, e.g. improved nutrition knowledge.	Qualitative interviews with store managers/ owners.
	Feedback from community and external organisations	Informal or formal recognition (such as accreditation program or award).	
	Retailer level of satisfaction with strategy	Level of general satisfaction and/ or intention to continue with the strategy; Level of satisfaction with other outcomes including customer perceptions and commercial viability.	
	Community stewardship	Perception of business impact on customer health behaviours and outcomes.	
Customer perceptions	Customer level of satisfaction with strategy	Customer feedback relating to the overall strategy, or characteristics of the strategy, e.g. tastiness of new offerings.	Customer surveys (e.g. exit surveys)
	Customer level of satisfaction with store	Level of customer satisfaction with range, healthiness, price etc., or store overall.	
	Customer demand for healthy items	Demand for new or existing healthy food and beverage items at intervention outlet. A measure other than sales of strategy target foods.	
	Customer demand for healthy food at other retail sites	Sales of target foods at nearby food outlets.	Electronic sales data or receipts, customer surveys
	Consumer welfare	"Individual [consumer] benefits derived from the consumption of goods and services". ^c Often quantified via willingness-to-pay.	
Community outcomes ^d	Community perceptions of strategy or similar	Level of community acceptability of strategy.	N/A
	Broader social impact	Level of retailer or customer reported retailer-customer rapport.	N/A
	Societal shift towards healthier food	Community sales of target foods; number of retailers implementing the strategy.	Electronic sales data, customer surveys
	Level of barriers for other retailers to implement similar policies	Range of healthy food or beverage alternatives offered by local supplier.	N/A

N/A, no relevant tools found in scoping review.^a Due to the scoping nature of this review, these were not the only possible ways of measuring these outcomes. Additional outcomes were assessed on a case by case basis.^b Data collection methods as identified in scoping review.^c Organisation for Economic Co-operation and Development (OECD), 2003 [cited 22 Jun 2018] Available from: <u>https://stats.oecd.org/glossary/</u>^d Community outcomes related to the strategy under study, not general community trends.

Appendix 4 Summary of the online ineractive workshop, Wednesday 18 November 2020

Developing a research agenda for improving the healthiness of urban food retail environments in East Asia and the Pacific

Aims and format of the meeting

Given the importance of building capacity for evidence-based policy advocacy to address child overweight and obesity, the UNICEF EAPRO Nutrition and Private Sector Engagement teams organized an online expert workshop on 18 November 2020 in collaboration with Deakin University and VicHealth.

The aim of the meeting was to generate momentum around a UNICEF research agenda to contribute the improvement of the urban retail food environment, with discussion focused on the background briefing paper prepared for this meeting.

In addition to a presentation of the findings of the briefing paper, three smaller group discussions focused on 1) supermarkets and convenience stores, 2) fast food outlets (quick service restaurants), and 3) informal food environments. A panel discussion followed, including both presentation of highlights from group discussions and an opportunity for questions.

Summary of discussions

- The retail environment in the region is complex due to the big differences in where people buy their food between and within countries. Mapping of the food retail environment needs to bear this complexity in mind, but it is clear that this is a necessary first step to drive a policy relevant research.
- Research should be guided by clear definitions to ensure comparability and policy relevance. For instance, what are informal food environments? What is fast food? What could be defined as healthy and unhealthy food and does that differ between countries? Which types of food marketing practices are in place?
- Policy goals should be in sight at all times, including at local, regional and national levels. This can include locally relevant evidence from mapping of the food retail environment, engaging national opinion leaders and champions (including retailers) and building demand from the public and retailers. Mapping of policy options is also important, as is demonstration of negative economic effects of different retail models (where possible).
- It is important to keep children and caregivers as the focus. The 'food journey' should be better understood which are the factors that influence children's unhealthy food consumption?
- Some examples of relevant work already exist in the region and should inform further action in this area. A co-ordinated effort from an alliance of allies is important, starting with this workshop.
- Risks including conflicts of interest in engaging with retailers need to be seriously considered and mitigated wherever possible.
- Working with countries where research partners with the requisite skills and capacity already exist should be prioritised.
- UNICEF is in an ideal position to co-ordinate an alliance and ensure policy relevance of research.

Potential first projects:

- Mapping of the urban food retail environment was agreed as the most important first step. Initial work could include:
 - Assessment of relevant tools that could be used as is, or customized, for different countries and settings.
 - Use of existing sources of aggregated data to map changes in all retail food environments over time and in all countries in the region.
 - Identification of promising policy options and the types of evidence they would require in a small number of countries.
 - Ensuring that qualitative data sources are included to create the story of how unhealthy food environments impact individuals (parents and children in particular).

Next steps

The group of participants represents a fledging alliance to work together in building a strong evidence base for action to improve urban food retail environments in East Asia and Pacific. UNICEF EAPRO will continue to engage the world's experts in this field and collaborate with internal and external experts on this agenda. The scoping paper and this meeting report will be made available, and an initial work plan developed, including identification of potential funding sources.

Workshop Participants:

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