Ultra-Processed Foods and Human Health 2

Policies to halt and reverse the rise in ultra-processed food production, marketing, and consumption

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Dietary patterns high in ultra-processed foods (UPFs) have been associated with poor diet quality and health outcomes, and are displacing healthier dietary patterns—meals and dishes prepared with fresh and minimally processed foods—in most parts of the world. In the second paper of this Series, we propose a set of government policies aimed at halting and reversing the rise of UPFs worldwide. To date, policies have mainly focused on reducing consumption of foods high in added fats, sugar, and sodium, many of which are UPFs. However, we propose that these efforts be strengthened and expanded to address a broader set of food system drivers influencing the production, marketing, and consumption of UPFs. This Series paper addresses four food policy domains that correspond to the key dimensions of food system drivers of UPF production, marketing, and consumption: UPF products, UPF food environments, UPF manufacturers, fast-food corporations, and supermarket corporations retailers, and food supply chains. For each domain, we explore policy options and focus on large-scale food system measures that target areas in greatest need of change, and their potential impacts. We also examine policies to protect, incentivise, and support dietary patterns based on fresh and minimally processed foods, particularly for lower income households. Which policy actions governments decide to prioritise will depend on each country's level of UPF consumption, along with many other issues unique to each country. We emphasise the importance of advancing this agenda in all countries, irrespective of their development status, to promote healthier diets among populations.

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Introduction

The rapid worldwide increase in the availability, marketing, and consumption of ultra-processed foods (UPFs), along with the extensive research literature on their harmful impacts on various aspects of diet quality and their association with a wide range of diseases, have been described in the first paper of this Series by Monteiro and colleagues.[1] Defined within the Nova classification system as formulations of food substances and additives containing little or no whole foods, and designed to displace the other three Nova groups (ie, unprocessed or minimally processed foods, processed culinary ingredients, and processed foods) while maximising industry profits,[2] UPFs have introduced a new paradigm in nutritional epidemiology, with substantial implications for food policy.

The second paper in this Series examines the policy actions needed for halting and reversing the increase in UPF production, marketing, and consumption. In some settings, such as schools and school food procurement programmes, completely eliminating UPFs would be ideal; however, in other settings, promoting substantial reductions in the production, marketing, and consumption of products would be adequate and in line with current evidence showing that a reduced share of UPFs in diets is associated with better health outcomes.[3] Here, we focus on UPF policies that are government led, national, and mandatory to be effective, as evidence shows that voluntary industry actions are insufficient in scope, implementation, and impact.[4–6]

We start by outlining key concepts to clarify the need for policy evolution. To date, food policies have primarily aimed to reduce the intake of nutrients linked to chronic diseases from foods high in fats, sugars, and salt (HFSS). These policies have largely aimed to shift consumer behaviour through information campaigns and to promote product reformulation. Although these measures have indirectly targeted many UPFs, they fail to address the broader set of issues—particularly UPFs reformulated to achieve nutrient content below thresholds established by regulations. To more effectively reduce the share of UPFs in diets, dedicated policies that explicitly target UPFs are needed to complement the existing nutrient-based approach. Furthermore, food policies should recognise that the responsibility for the rise in UPF-dominated dietary patterns lies less with consumers and more with food corporations, who should be held accountable for their role.

To achieve these goals, we suggest that present policies need to be expanded in at least two directions. First, broadening the policy focus from HFSS foods to HFSS foods and UPFs. We outline approaches to operationalise the identification of UPFs for different policy purposes based on the Nova definition (panel 1).[28] Second, we provide options to both strengthen current food environment policies and develop new policies that address systemic drivers of UPF production, marketing, and consumption, especially by targeting the large global corporations and retailers that shape food environments and food supply chains, and influence policies. The commercial determinants of ultra-processed diets, including the market and political practices of its leading corporations, and strategies for mobilising a global public

Key messages

- The global rise of ultra-processed foods (UPFs) in human diets is linked to poor diet quality and increased risk of several chronic diseases. We identify four distinct dimensions of food systems that have roles in driving the production, marketing, and consumption of UPFs, and to which policies can and should be addressed: UPF products, food environments, UPF manufacturers and retailers, and food supply chains.
- The current policy focus on decreasing the consumption of foods high in fats, sugars, and salt (HFSS), many of which are also ultra-processed, should broaden to also target UPFs. Some countries have already adopted an intermediate stage of targeting UPFs by adding UPF markers to nutrition profiling models used for regulatory purposes.
- Food environment policies should also broaden from focusing on food reformulation to mandatory regulations that aim to address and restrict the marketing, availability, and affordability of UPFs. These policies include changes to taxes and product labelling: Colombia and Mexico have food and beverage taxes along with front-of-package warning labels (with Colombia's laws all based on the same nutrient profile model); Brazil's national school feeding programme has eliminated most UPFs, with 90% of the food required to be whole or minimally processed by 2026; and Chile has integrated front-of-package warning labels on unhealthy foods with restrictions on their marketing—including a ban on television advertising from 0600 h to 2200 h—and prohibition of their sale or promotion in schools. These policies, along with other impactful changes, should be strengthened, coordinated in a mutually reinforcing way, and extended to more countries.
- A potentially wider range of policies could help to address the broader food system and supply chain drivers of production, marketing, and consumption of UPFs, including those focused on corporate UPF manufacturers and retailers, fast food corporations, agricultural production, international trade, and environmental impacts. This broader approach is particularly important for preventing an increase in UPF diets in low-income and middle-income countries.
- Policies are particularly needed to directly restrict the market and political power and activities of transnational UPF corporations (including fast-food companies), given their role as primary drivers of UPF consumption. UPF corporations could potentially be the unit of regulation, including their entire portfolios of products, brands, product sales, and marketing and political activities.
- Complementary policies are needed to support the production, availability, and affordability of fresh and minimally processed foods and their preparation as dishes and prepared meals, and address the socioeconomic and gender inequalities that drive demand for UPFs. Few programmes to date address these issues on a national level.
- The prioritisation of these policies will likely depend on each country's stage in the transition towards diets high in UPFs, and on cultural, political, and socioeconomic contexts. However, global action is urgently needed to promote healthier diets.

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health response, are outlined in greater detail in the third paper of this Series, by Baker and colleagues.[29]

We identify four key food policy domains to structure our analysis and recommendations: (1) UPF products; (2) food environments; (3) UPF manufacturers and fast-food and supermarket corporations; and (4) food supply chains (see panel 2). These domains reflect essential components of the food systems that collectively drive the production, marketing, and consumption of UPFs. For each domain, we review existing policies and propose new policy initiatives (see also the table and panel 3). Evidence indicates that multicomponent interventions—those that operate across individual, environmental, and policy levels—are among the most effective strategies.[48] However, this Series paper focuses on food environment and systemic food policy interventions, where both the need and potential for meaningful change are greatest, especially in addressing widening health inequalities.[49]

We recognise that the rising demand for UPFs, most of which are ready to eat or ready to heat, is shaped by broader socioeconomic shifts, including changing work and living patterns and increasing time and financial pressures on households. This demand is further intensified by the large-scale production and aggressive marketing of UPFs. Policies aimed at reducing UPFs will therefore also need to be complemented by policies that increase the availability and affordability of healthy, unprocessed or minimally processed foods (ie, Nova group 1 foods)—including ready-to-consume or ready-to-heat forms, and other time-saving options (panel 4). These efforts should also address the underlying socioeconomic inequalities that drive demand for UPFs for much of the population, including the unequal gendered burden of cooking, feeding children, and other domestic work.

The expansion of food policies targeting HFSS foods to also include UPFs should consider settings where UPFs dominate and affordable alternatives are scarce. In such cases, applying broad policies to all UPFs could harm populations reliant on them. A gradual and selective policy approach, with tailored strategies, might be more appropriate (panel 5).

This Series paper proposes a set of environmental and food systems policy options to support governments in gradually shifting diets away from UPFs. Although we acknowledge that global evidence should be adapted to align with specific policy priorities and contexts across countries, we emphasise that a core set of actions can already be implemented globally to address the urgent need to improve population diets. In this process, innovative and locally grounded responses could also emerge to help address the underlying drivers of UPF-based diets.

Policies for ultra-processed food products

Many countries have implemented food policies that directly or indirectly regulate the nutrient and ingredient content of foods. Most recent policies have targeted HFSS foods and aimed to reduce sugars, sodium, and saturated and trans fats through taxes and other regulations.[72] Lowering the content of nutrients of concern in HFSS foods reduces population-level intake, leading international agencies to endorse nutrient reformulation as a cost-effective strategy for preventing non-communicable diseases.[73]

However, although product reformulation policies can aid in lowering consumption of harmful nutrients, they are not effective—and could even be counterproductive—in reducing UPFs. Reformulating the nutrient content of

UPFs without addressing their production process (eg, degradation of the food matrix) is technically unfeasible, as it often involves substituting nutrients of concern with other UPF ingredients (ie, replacing sugar with non-nutritive sweeteners or fat with modified starches and emulsifiers). These reformulated products

Panel 1: Use of Nova for policy purposes

The Nova food classification system, with its ultra-processed food (UPF) group,[1] offers new tools for policy makers to contribute to dietary guidance and education, dietary surveillance, and food regulation. Although the operational definition of UPFs in Nova can be readily applied for the first two purposes, its use in food regulation requires nuance.

Dietary guidelines and education

These initiatives can incorporate Nova classifications by recommending that unprocessed or minimally processed foods (ie, Nova group 1) be the basis of diets; that processed culinary ingredients (Nova group 2)—such as oils, salts, and fats—be used sparingly in cooking; that processed foods (Nova group 3) be consumed in small amounts, including when used in freshly prepared dishes and meals; and that consumption of UPFs (Nova group 4) be reduced or avoided altogether. Replacing vague terms, such as so-called extras or discretionary food, with the better-defined and evidence-based term UPF can help clarify the message.[7] Beginning with Brazil in 2014,[8] more than ten countries have included the recommendation to reduce or avoid UPFs into national dietary guidelines.[9,10]

Dietary surveillance

Surveillance of dietary exposure to UPFs relies on measuring the share of Nova group 4 in the diet (ie, by weight or energy), a metric widely used in large, population-based cohort studies and dozens of nationally representative cross-sectional studies,[1] and preferably assessed with tools specifically designed to measure Nova group intakes in dietary surveys.[11–14] A simplified alternative is the validated Nova-UPF score, which counts the number of UPF subgroups consumed based on a country-adapted screening tool.[15,16] This score has been recognised by WHO, the Food and Agriculture Organization of the UN, and UNICEF as one of four key metrics for monitoring diet quality globally.[17]

Food regulation

The identification of UPFs in food regulation—including labelling and claims, taxation, marketing restrictions, and public procurement—requires nuance to address public health goals and practical implementation and legal challenges.

First approach (identifying UPFs with the Nova operational definition)

This approach involves regulating all products that contain at least one marker of ultra-processing—specifically, food substances used predominantly in industrial settings or sensory-related additives. This approach can be implemented with algorithms, such as those used experimentally by global consumer platforms (eg, Open Food Facts, Yuka, and Perfact). The main advantage of this approach is that it aligns directly with the Nova criteria used in research linking UPFs to adverse health outcomes.[1,3] However, a key limitation is the potential for legal challenges due to inconsistent ingredient labelling, additives with dual functions, and cross-country variation in the classification of industrial-use ingredients.[18] The feasibility of this approach could be greatly strengthened if food regulators mandated standardised reporting of food substances and additives that serve as UPF markers.[1,19]

Second approach (identifying UPFs with nutrient thresholds and UPF markers)

An alternative approach is to identify unhealthy foods as a whole. This identification is done by applying criteria that combine nutrient thresholds established by nutrient profile models (NPMs; preferably those developed by WHO regional offices) with the presence of easily identifiable UPF markers. Some authors have explored artificial intelligence algorithms to systematically identify the nutrient content for UPFs and UPF markers.[20,21] The most practical example of this hybrid approach is the Pan American Health Organization (PAHO)'s NPM.[22] Already adopted in Mexico, Argentina, and Colombia, the PAHO model combines nutrients thresholds with restrictions on the presence of non-nutritive sweeteners or both caffeine and non-nutritive sweeteners in the ingredients list. By following Nova classifications, the PAHO approach could be further extended to include other sensory-related additives that are markers of food ultra-processing. Analyses of nationally representative household food purchases in the USA,[23] the UK,[24] and food and drink products sold in ten large supermarkets in Brazil[25] indicate that expanding existing regulatory nutrient-based criteria to include UPF markers—such as non-nutritive sweeteners, colourants, and flavourings—would capture nearly all unhealthy products (ie, all products with unbalanced nutrient profiles, either processed or ultra-processed, and nearly all UPFs as defined by Nova).

One advantage of this approach is that, in countries already regulating products with unbalanced nutrient profiles, implementation would simply require the addition of a few selected markers of ultra-processing, making it less vulnerable to legal challenges, straightforward to integrate in existing frameworks, and arguably the most promising option for immediate global adoption.

Either of these approaches should integrate in—not replace—existing regulations, including those addressing products with unbalanced nutrient profiles, to broaden their coverage of harmful foods and enhance regulatory effectiveness. For example, placing UPF warnings alongside Nutri-Score rankings on front-of-pack labels has been proposed, and an evaluation

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For more on **Open Food Facts** see https://world.openfoodfacts.org/

For more on **Yuka** see https://yuka.io/en/

For more on **Perfact** see http://perfact.co/

(Panel 1 continued from previous page)

study suggests this action is well understood and accepted by consumers.[26] Similarly, an online experiment conducted in Brazil also shows that combining UPF warning labels with nutrient warning labels improves consumers' ability to correctly identify UPFs, compared with nutrient warning labels alone.[27]

Policy makers should carefully weigh the strengths and limitations of the policy applications outlined and consider integration in existing policy priorities, regulatory capacities, and anticipated industry responses.

Panel 2: Research approach and methods

In this Series paper, we adopted a combined systematic review of the food environment and minimally processed food domains with a narrative synthesis approach. This approach integrated existing literature from diverse academic and policy sources to highlight key trends, challenges, and developments in policy responses that could be used to address trends in ultra-processed food (UPF) consumption. We conducted a mix of structured and branching searches of academic databases and grey literature sources, refined iteratively as our understanding of the topic evolved (see appendix pp 1–2). Our inclusion criteria required that documents focus on policies, regulations, or norms relevant to four key sectors and elements (domains) of systems that drive the production, marketing, and consumption of UPFs: UPF products; food environments; UPF manufacturers, fast-food corporations, and supermarket corporations; and food supply chains. Specific policy recommendations were identified in the literature and refined through team discussion (see the table for further details).

See Online for appendix

Food policy domains

UPF products

- Nutrient composition and reformulation
- Regulation of ingredient composition

Food environments

- Desirability and information (ie, on dietary guidelines, front-of-pack labelling, and food marketing restrictions)
- Affordability (ie, effects of food taxes and subsidies)
- Availability (ie, in food retail and food service environments, and in schools and other public institutional environments)

UPF manufacturers, fast-food corporations, and supermarket corporations

- Market power and activities of UPF corporations
- Political power and activities of UPF corporations

Food supply chains

- Agricultural policies
- Global trade policies
- Environmental policies

The UPF products domain refers to policy initiatives that aim to directly or indirectly regulate the composition of UPFs, particularly in terms of reformulating their nutrient and ingredient content. The food environments domain—which relates to the immediate availability, affordability, and desirability of UPFs—has been defined and analysed within the International Network for Food and Obesity/non-communicable diseases Research, Monitoring and Action Support framework, and other food environment literature.[30,31] This domain includes dietary guidelines and food environment interventions, such as front-of-pack labelling, taxes, marketing to children, and food retailers, as well as institutional food environments such as school food programmes.[5] The domain of UPF corporations focuses on the role of the large packaged and fast-food corporations that produce and establish the composition of a large share of UPF products in many countries, as well as the role of supermarket corporations in promoting the distribution and consumption of UPFs. Here, we draw on the literature to identify interventions aimed at reducing their market and political power.[32,33] In the food supply chain domain, we focus on the ways agricultural, trade, and environmental policies have facilitated the rise of UPF consumption, and the need for policy changes along these supply chains.

To illustrate key lessons, we also included two case studies developed by in-country researchers: Chile's food labelling and marketing law, and Brazil's national school feeding programme. In addition, background studies were commissioned on the identification of UPFs in the food supply for policy purposes, and on policies for strengthening supply and demand for healthy food. Our final analysis blended insights from the reviewed literature, with new ideas informed by the authors' professional experience and group discussions. Throughout this Series paper, we use the term UPF as defined by the Nova food classification, as meaning "…branded commercial formulations made from inexpensive ingredients extracted or derived from whole foods, combined with additives, and mostly containing little to no whole food."[34]

retain the characteristics of UPFs, such as hyper-palatability and the absence of whole foods, while often increasing additive content.

Emerging initiatives have considered regulating the ingredients of UPFs, rather than their nutrients. Chile's front-of-package labelling law treats harmful nutrients as added ingredients rather than intrinsic components of HFSS foods, and regulates their content.[35] The Pan-American Health Organization's Nutrient Profile Model includes non-nutritive sweeteners in their regulated ingredients, and Mexico and Argentina mandate warning claims for caffeine in products targeted at children.[22]

Some food companies are voluntarily removing ultra-processed ingredients as part of their marketing strategies, including replacing synthetic flavourings to substantiate their claim that the products contain no artificial flavours.[37,74,75]

However, a more direct approach to regulating product composition can also be implemented by setting mandatory nutrition standards that define maximum and minimum levels of specific nutrients or ingredients in UPFs. Notable examples include the bans or limits on industrial trans fats or partly hydrogenated oils introduced in several countries since the early 2000s, and South Africa's sodium limits for certain food categories (eg, baked goods).[76,77] Nutrition standards for infant and follow-on formulas, which are UPFs,[78,79] also establish minimum and maximum nutrient requirements for selected nutrients.[80] Expanding such standards to set upper and lower limits on UPF-specific ingredients,

	Current best practice	Policy recommendations
UPF products		
Nutrient and ingredient composition	Bans or restrictions on trans fatty acids and partly hydrogenated vegetable oils (eg, in Denmark), and on sodium content of bakery goods (eg, in South Africa); minimum and maximum limits on some nutrients in infant foods	Extend restrictions on UPF ingredients and additives, such as non-sugar sweeteners and emulsifiers, following research and evaluation; evaluate the need of defining maximum content for some additives
Food environments		
Front-of-package labelling schemes	Mandatory warning labels for essential nutrients (eg, saturated fats, sugars, and sodium) based on strict nutrient profile models (eg, the Pan American Health Organization's Nutrient Profile Model); mandatory warning claims or labels for some additives (eg, non-sugar sweeteners and caffeine in Mexico); ban on health claims for food products with warning labels	Switch from voluntary labels based on nutrient rating schemes to mandatory warning labels that identify HFFS foods and UPFs; extend warning labels to foods for infants and toddlers aged 0–3 years (ie, develop a specific nutrient profile model); ban nutrient and health claims on food products with warning labels
Marketing regulations	Mandatory bans on advertisements for HFSS products (based on standard nutrient profiles) to children (age <14 years) on television and other media from 0600 h to 2200 h (eg, as seen in Chile); mandatory bans on children-directed promotions, point-of-sale marketing, product design and packaging marketing strategies, and other forms of marketing of HFSS products that appeal to children (eg, as seen in Chile)	Extend time of marketing ban from 0600 h to 2300 h for all media; extend the age of marketing bans to children aged ≤18 years; expand and enforce restrictions on marketing of infant and toddler foods and beverages, including formula; create comprehensive digital marketing bans on HFSS products and UPFs
Food taxes and subsidies	Excise tax of 20% on SSBs (eg, Colombia's stepwise 12·5%, 15%, and 20% tax); excise tax of 10–20% on HFSS products (based on standard nutrient profile); tax exemptions for minimally processed foods (eg, unprocessed foods in Australia are exempt from the Goods and Services tax); income-related subsidies for vulnerable, lower income populations, with a focus on healthy foods	Increase the excise tax of 20% on SSBs; excise tax of 20% on selected UPF food categories; tax revenues directed towards subsidising initiatives that increase access and affordability of fresh food for vulnerable, lower income households and communities
Food retail and food service	Isolated initiatives for restricting HFSS products (based on standard nutrient profiles) in health-care settings (eg, as seen in Scotland); isolated initiatives in food outlets, mostly around schools; isolated initiatives for improving the availability of nutritious foods in stores and healthy food outlets; experiments with food placements for healthy foods (eg, shelf, end of aisle, or near cash register)	Evaluate restrictions on the availability of HFSS products and UPFs in corporate supermarkets and other food retail and fast-food chains; mandatory planning restrictions on HFSS products and UPFs in food outlets around schools; governmental initiatives for improving the availability of minimally processed heathy foods in stores and fast-food chains
School food environments	Ban on sale of HFSS products in school canteens (eg, Chile); school meal programmes with restrictions on proportions of UPFs (eg, Brazil's national school feeding programme); ban on marking HFSS products in or around schools	Restrictions on the amount of HFSS products and UPFs in school canteens and vending machines; restrictions on the amount of HFSS products and UPFs in school meal programmes; reduced availability of HFSS products and UPFs around schools; ban the marketing of HFSS and UPF products in or around schools
Dietary guidelines	Inclusion of Nova recommendations for UPF reductions in national dietary guidelines (eg, Brazil)	Adoption of Nova recommendations for UPF reductions in national dietary guidelines; use of dietary guidelines as tools for achieving policy coherence in governmental action
Promotion of minimally processed foods	Some programmes, subsidies, and tax exemptions for fresh fruit and vegetables; public procurement and public food provisioning of minimally processed foods (eg, Brazil's national school feeding programme and community kitchens in Peru)	Public provisioning and subsidisation of minimally processed meals in schools, universities, hospitals, military, and community kitchens; income transfers for minimally processed food procurement at the national level for vulnerable populations; commercial and public models for the preparation and distribution of minimally processed ready-to-eat and ready-to-heat foods and meals
UPF manufacturers and fast-food and supermarket corporations	Indirect regulation of corporations' products and marketing practices through existing food environment policies; reversing government marketing tax deduction for UPF companies (eg, as seen in Ecuador); restricting participation in scientific and expert committees, scientific research, and publications by food manufacturers that have a large portfolio of UPFs (eg, the International Union of Nutritional Science's Conflict of Interest policy)	Establish systems for monitoring the quality and proportion of corporate portfolios of UPFs; target regulations for the product portfolios and marketing practices of large UPF corporations; evaluate the possibility of implementing restrictions on market size and concentration (eg, through anti-trust laws and market caps); disclosures and restrictions on involvement in scientific and expert committees, scientific research, and publications; establish systems for monitoring corporate political activities (eg, political donations and lobbying)

HFSS=high in fats, sugars, and salt. SSB=sugar-sweetened beverage. UPF=ultra-processed food.

Table: **Summary of policy recommendations**

including additives such as sweeteners, emulsifiers, and colourants, could strengthen UPF-specific policies. Although these additives are regulated for safety, concerns remain about current oversight—particularly regarding the cumulative effects of exposure to multiple-additive concoctions in the UPF supply.[81–83]

Other compositional characteristics of UPFs—such as their hyper-palatability and potential for overconsumption—majorly contribute to their demand, consumption, and effects on health. These characteristics can result from factors including degradation of the food matrix, artificial flavours, high levels of added sugar and salt, and engineered texture and sensory appeal.[1,68,84] Addressing these factors presents important potential avenues for future regulatory innovation.

Panel 3: Chile's integrated food environment policies

In June, 2019, Chile finalised the implementation of its food labelling and marketing law. This policy is unique because it combines food environment actions at different levels: consumer information, marketing restrictions, and healthier school environments—at the same time and based on the same underlying nutrient profile model. Specifically, the law includes: (1) black octagonal front-of-package labels that warn consumers that the food product is high in fats, sugars, or salt (HFSS) or calories (or combinations thereof); (2) marketing restrictions on regulated foods and beverages to children younger than 14 years, including restrictions on advertising, promotions, free gifts, and depictions of cartoon characters on regulated foods; and (3) school and nursery school restrictions on free distribution of regulated foods, and banning their marketing.[35] The policy process and political factors shaping the development and implementation of this law, including interference by the UPF industry, is further elaborated in the third paper of this Series. Evaluations show that this approach of integrated and reinforcing policies has successfully modified the food environment and consumer behaviour, and that at least some of the effects are greater than those observed with single policies.[36] After the law was implemented, notable reductions in the content of regulated nutrients in many HFSS categories were observed, but almost 50% of packaged foods continue to carry a warning label.[37] Marketing of HFSS products to children decreased in about 60% of products, and the availability of these products decreased by almost 80% in public school settings.[37,38,39] Research shows that consumers notice and understand HFSS food warning labels independently of their educational levels, and report using these labels more than other nutritional information when deciding what food to buy.[40] These findings translate into reductions in purchased calories, total sugars, saturated fats, and sodium.[41] After 5 years of implementation, focus groups with mothers show that despite experiencing fatigue with the HFSS labels, they are now able to identify UPFs more easily and better understand the need to increase consumption of minimally processed foods, irrespective of their socioeconomic status.[42,43] These results highlight the value of reinforcing food environment policies that include strong warnings about unhealthy food consumption, together with other food environment actions, in potentially changing social norms. Adding a tax to HFSS products and using the revenue to subsidise purchases of fruits and vegetables by low-income households would help to create an even more comprehensive package of food environment actions to promote healthier diets in Chile. Nevertheless, the Chilean example also shows the limits of food environment policies when UPF definitions (see panel 1) merely focus on nutrients, and do not consider a wider range of UPF markers. Reformulation to reduce sugar has been accompanied by a notable increase—15% among children—in the use of non-nutritive sweeteners (NNS).[44,45] These findings have led to implementation of a NNS warning claim (ie, "contains NNS") in regulations in Mexico and Argentina, and a warning label on NNS food products in Colombia. Detailed analyses of the changes in television advertisements for sugar-sweetened beverages after the implementation of Chile's labelling law found that, for these beverages, total advertisements decreased by 61·8% and child-directed advertisements declined by 51·8%; however, for beverages not high in sugar, total advertisements increased by 61·8% and child-directed advertisements by 62·9%.[38,46,47] These results are worrying because research suggests that advertisements for one product can increase consumer preferences for different products from the same brand and product category (ie, increase brand preference).[47]

Overall, these results suggest that to protect children from the harmful effects of UPFs, countries need regulations that target a larger proportion of UPFs as well as UPF corporations themselves.

Policies for food environments

Food environment policies focus on the contexts in which people purchase, consume, and receive information about food, through shaping their availability, affordability, and desirability.[85] Food environments are constructed both commercially and through institutional settings, such as schools, hospitals, prisons, and the armed forces. In this section, we review policies relating to front-of-package interpretive labelling, food marketing, food taxes and subsidies, food retail, and food service, and the role of national policies and global actors (eg, Codex, WHO, the Food and Agriculture Organization of the UN (FAO), and UNICEF) in achieving their integration. Food environment policies have made gradual progress over the past decade; however, just as tobacco control policies took many decades to become effective, efforts to reduce the consumption of unhealthy foods remain in their early stages. In this context, we present a range of policy options to support further development and implementation. Specific policy recommendations are listed in the table.

Front-of-package labelling

Front-of-package labelling regulations aim to provide clear and simple information about a product's nutrient content and healthfulness. Initially, these labels highlighted positive attributes of foods to encourage consumption, but since 2014 they have shifted to interpretative labels based on nutrient scores, or profiles to warn consumers about poorer quality products.[86] Several types of front-of-package labelling have been shown to modify food purchasing or consumption. However, evaluation studies have shown that warning labels are the most effective option for discouraging UPF consumption, compared with ranking-style labelling schemes such as Nutri-Score and Health Star Ratings.[87–90] Front-of-package warning labels are currently the only approach shown to substantially reduce purchase and intake of unhealthy foods and nutrients.

Following the introduction of Chile's regulations (panel 3),[36,37,41,85] several countries have adopted front-of-package warning labels, including Argentina, Brazil, Canada, Colombia, Israel, Mexico, Peru, and Uruguay.[36,37,41,85] Some African and Asian countries are also considering warning labels.[22,91] Front-of-package warning labels have primarily targeted UPFs with high contents of

nutrients of concern; however, this could be extended to include a broader set of UPFs by adding other markers (panel 1). For example, in Mexico and Argentina, warning claims are included for both non-nutritive sweeteners and caffeine, and in Colombia, warning labels are used for foods containing non-nutritive sweeteners. Warning labels could also evolve to pictorial warnings (eg, dental caries in a mouth, or an amputated leg or foot from diabetes complications), and plain packaging.[92] We particularly recommend warning labels be added to ultra-processed or HFSS foods targeted at infants and toddlers, as these foods are currently not included in regulations.[79,93] We also recommend prohibiting nutrient and health claims on UPFs to avoid so-called health halo effects and attempts to distract shoppers with multiple labels and claims.[94,95]

Marketing restrictions for children

UPFs are aggressively and ubiquitously marketed through mass media, digital media, and sponsorships, much more so than other types of foods.[96] Several countries have introduced restrictions on some forms of food-and-beverage marketing to children (aged <12 years or ≤18 years), although many of these restrictions are voluntary or created by the industry.[97] Efforts to promote voluntary industry commitments have generally had minimal or no impact; moreover, they have often been used by industry to prevent mandatory regulations (elaborated in the third paper[29] of this Series).[98–103] Chile has some of the most comprehensive food marketing regulations worldwide (panel 3). The country's mass-media marketing ban applies to billboard, print, and television, and restricts the use of prizes, gifts, child-friendly wording, and inclusion of cartoon characters in advertisements for HFSS foods. However, these restrictions only apply to products aimed at children younger than 14 years. Greater limitations on digital marketing are needed to address the huge global gap.[38,46,104,105] The UK Government has approved a law banning television advertisements of HFSS foods from 0600 h to 2300 h, as well as restrictions on print, digital, and radio advertisements, but has issued no formal regulations to date.[106]

We recommend further efforts to restrict UPF marketing. Measures aimed at protecting children could use the broader approach for identifying unhealthy foods proposed in panel 1. Policies should also extend the age reach to 18 years and the restricted time periods beyond children's hours, and include all forms of digital media. Norway recently passed legislation banning the marketing of unhealthy foods and beverages to children younger than 18 years.[107] Marketing restrictions for food products aimed at infants and toddlers—particularly breastmilk substitutes, toddler milks, and commercial complementary foods—should be more strictly enforced and regulatory frameworks ideally extended to 3 years.[108–110]

A key gap in current marketing regulations is the oversight of brand-level strategies.[7] Companies build brand loyalty through tactics such as promoting healthy products, sponsoring sports, and engaging in civic activities. These companies often market entire brands—using logos, icons, and characters—to influence children,[111,112] such as ranges of toddler milks designed to resemble infant formulas.[109] These strategies remain largely unregulated, underscoring the growing recognition of the need for broader, brand-level marketing restrictions.[113]

Taxes and fiscal policies

In most countries, UPFs tend to be inexpensive both in absolute terms and in comparison with non-UPF equivalents.[114,115] Product prices greatly affect purchases;

Panel 4: Brazil's national school feeding programme

Brazil's national school feeding programme (Programa Nacional de Alimentação Escolar; PNAE) is a unique example of a food and nutrition policy that simultaneously restricts the procurement of processed and UPFs while promoting the purchase of locally sourced, minimally processed foods through a values-based public procurement approach.[50] Universal and free of charge, PNAE currently provides meals to more 40 million students aged 0–18 years (ie, approximately 80% of all Brazilian schoolchildren), making it one of the largest school feeding programmes in the world.

Over the past four decades, the programme has progressively integrated emerging scientific evidence on healthy eating. In 2009, Brazil became the first country to mandate direct procurement from family farmers.[51] Priority is given to local producers, organic and agroecological crops, women, and socially vulnerable groups (eg, Indigenous communities and *quilombolas* [ie, Afro-Brazilian inhabitants of self-governing communities]).[51,52] The inclusion of family farming products in school meals has been associated with increased procurement of vegetables, fruits, and legumes, as well as reductions in the use of UPFs.[53] Such an inclusion has also contributed to shifts from conventional to family-based agriculture, stimulated national growth in Gross Domestic Product, and generated both direct and indirect employment.[54] These outcomes are particularly important given the modest BRL 1·9 billion budget allocated to PNAE's direct family farming procurement, especially when compared with Brazil's agribusiness sector, which is dominated by export crops such as soybeans and corn and accounted for approximately BRL 2·6 trillion—or 24% of national Gross Domestic Product—in 2023.[55] Notably, family farming in Brazil is closely linked to diversified and agroecological food production systems that enhance biodiversity.[56]

In 2020, another policy innovation was incorporated into PNAE, which aligned its programme procurement guidelines with the Brazilian Dietary Guidelines guidance on reducing processed foods and avoiding UPFs.[8] Currently, local and state governments in Brazil are required to allocate no more than 15% of PNAE's budget to the procurement of processed and ultra-processed foods. At least 80% of the same funding must be dedicated to the purchase of unprocessed or minimally processed foods, while 5% can be used for culinary ingredients such as salt, oil, and sugar, which are necessary for preparing freshly cooked meals.[57] Revisions to the programme's design are scheduled to take effect in 2026, reducing the maximum allowable expenditure on processed and ultra-processed foods to 10% of federal funding and increasing the minimum allocation for unprocessed and minimally processed foods to 90%.[57] Preliminary—yet encouraging—outcomes suggest that this approach offers a scalable model for implementing restrictions on the public procurement of UPFs in institutional settings, including schools, hospitals, military facilities, and workplace cafeterias. Notably, before the 2020 revision of PNAE's procurement regulations, approximately 40% of Brazilian municipalities were already in compliance with the proposed restrictions to UPFs.[58] As a result of these innovations, PNAE has served as a model for several countries and international organisations seeking to implement double-duty and triple-duty food and nutrition policies in other contexts.[59]

Panel 5: Policies in countries facing different stages of the ultra-processed dietary transition

The ultra-processed dietary pattern is becoming dominant in all countries worldwide.[1] However, high-income, middle-income, and low-income countries tend to be at different stages of this dietary transition towards ultra-processed foods (UPFs).[60] UPF consumption is highest in some high-income countries, reaching over 50% of the total calories consumed per day in the USA, Australia, and the UK, where UPFs have come to form a central part of dietary patterns for most of the population.[61] Since the 1990s, UPFs have also risen rapidly in middle-income countries such as Chile, in which almost a third of calories (33%) are derived from UPFs.[62] Finally, UPF consumption is now rapidly rising in low-income countries in Africa and Asia, adding this threat to the existing challenges associated with inadequate and poor-quality diets.[63]

We suggest that the strategies, dietary aims, and the reach of policies (ie, whether to selectively prioritise or exclude some UPF subgroups) that governments take will need to be adapted to their stage of the ultra-processed dietary transition, as well as to other local socioeconomic conditions.

Countries with the highest UPF consumptions have continually prioritised reformulation-oriented policies, as has been the case in the UK and Australia, and the EU. However, reduced UPF consumption should be their aim. The dominance of UPF products and UPF corporations means that the availability and affordability of non-UPF versions of some categories of foods can be rare, such as non-UPF bread products in the UK.[64] In this situation, some UPF subgroups, such as packaged breads, could initially be exempted from regulations that target their price and availability to avoid detrimentally affecting people on low incomes, while discretionary subgroups (eg, sugar-sweetened beverages) can more readily be targeted, as has been the case in the UK.[65,66] Strong support for promoting fresh and minimally processed foods, particularly in more vulnerable, lower income groups, should be encouraged to progress UPF prevention policies in this context.

Countries at intermediate stages of the ultra-processed dietary transition need strategies that more directly target decreasing UPFs. Examples of this are provided by Latin American countries such as Chile, Mexico, and Brazil.[35,67] In these countries, policies have been implemented to more directly target and reduce the availability and affordability of UPFs. The recent introduction by Colombia of a tax on UPFs—primarily targeting products high in fats, sugars, and salt—represents an extension of these food environment policies. In these countries, UPF consumption is still mostly based on drinks and snacks, so targeting all or some major UPF subgroups is possible. Nevertheless, for more vulnerable, lower income groups, strong governmental support is still needed to promote minimally processed food consumption.

Finally, countries at the early stages of the ultra-processed dietary transition need strategies that aim to prevent the rise in UPFs, rather than acting when they already dominate local food systems and dietary patterns. A review assessing the implementation of food environment policies in four south Asian countries concluded that, compared with global benchmarks, implementation of food environment policies was generally weak and mostly related to food safety, rather than to UPFs and diet quality.[68] Similar findings have been reported for African countries such as Kenya and Ghana.[69,70] Large food corporations are already present in these countries; therefore, all policies suggested in this Series paper are applicable for adaptation and adoption. Countries such as Kenya, Ghana, and India are now considering front-of-package warning labels and other food policies.

For these countries, important learning experiences can be derived from middle-income countries that have faced opposition from UPF corporations to the introduction of stronger policies, such as those in Latin America. Civil society and coalition action have become key in these spaces for ensuring policy advancement and maintenance, including resource mobilisation and capacity building (see the third paper in this Series). In many of these countries, UPF prevention strategies will need to be integrated with undernutrition policies to address the multiple nutritional challenges facing these populations.[71]

therefore, many countries have applied taxes or so-called health levies on some HFSS foods. To date, almost all food tax policies have targeted sugar-sweetened beverages. More than 100 countries and smaller jurisdictions have instituted taxes on sugar-sweetened beverages, but few have conducted systematic evaluations of their impact on beverage purchasing or consumption patterns.[116,117] Existing studies have found that volume-based taxes provide greater revenue, yet tiered taxes or those based on grams of sugar are likely to have stronger dietary impact, not least because they also encourage reformulation (meaning the beverages are still UPFs but have lower sugar contents).[118] Taxes are less frequent in non-beverage products, but Hungary and Mexico have seen meaningful decreases in consumption of these products in proportion to the size of the tax.[119–121] In 2023, Colombia implemented a so-called UPF excise tax using criteria for HFSS foods. This tax will increase from 10% in 2023, to 20% in November, 2025.[85]

From an economic perspective, food taxes are regressive as they disproportionally affect low-income households that tend to buy inexpensive UPFs. From a public health standpoint, however, such taxes are progressive because lower income households tend to experience higher rates of untreated or poorly managed non-communicable diseases.[122,123] To offset the effect of taxes on lower income households, revenues should be used to subsidise fresh and minimally processed foods and freshly prepared meals, or cash transfers.[124,125]

Revenue from taxes on sugar-sweetened beverages can also be used to fund potable drinking water in schools, and public places where it does not currently exist.[126]

Food retail and food service environments

UPFs are ubiquitously available in many food retail and food service environments in high-income countries, and can dominate spaces in supermarkets, fast-food chain stores, and smaller stores and vendors, particularly in low-income areas.[63,127,128] Their presence varies in low-income and middle-income markets where UPFs are less dominant. We have identified a few initiatives that restrict HFSS sales, with a focus on food service rather than retail settings. Examples include food outlet restrictions in public institutions such as hospitals (eg, in Scotland), or voluntary bans on HFSS products in food service.[129]

Retail policies to reduce UPFs are scarce outside of school settings.[130–133] Some policies require noting the calorie content of foods on menus and fast-food boards, but as far as we are aware, no national policies address the marketing and placement of UPFs in retail food outlets. Although large portion sizes, particularly super-sizing, have been shown to promote increased caloric intake, few initiatives aim to reduce or regulate portion sizes. One notable exception is the portion cap rule, a failed 2014 initiative from the former Mayor of New York City to impose a cap on the size of sugary drinks sold at food service outlets. Although the policy showed promising reductions in energy intake during its implementation, it was ultimately reversed due to legal and political opposition.[134]

We recommend the use of warning labels on menus in fast food restaurants and added taxation on fast food products that are UPFs.[135,136] Also deserving of consideration are policy options in food service and retail settings to regulate UPF sales at the corporate level by restricting or applying penalties based on the proportion of total sales of UPF products; we further discuss this idea in the section Policies for ultra-processed food manufacturers and fast-food and supermarket corporations.

Food environments within schools

Schools have a crucial role in shaping children's dietary behaviours and health, especially for low-income students. Regulations can extend to canteens, vendors, and nearby stores. Some countries have implemented policies for promoting healthier food environments within schools. A recent review shows that 25% of countries worldwide have mandatory policies restricting access to unhealthy foods in schools and 16% ban marketing of some products.[137] For example, Chile's national labelling law restricts in-school promotion, distribution, and retailing of regulated products and has been linked to large improvements in dietary nutrient intake among children and adolescents in schools compared with other settings.[138] Other examples include restrictions on non-nutritive sweeteners and other additives (eg, in Argentina and Uruguay) and restrictions on entire food categories such as sugar-sweetened beverages, crisps (or chips), and confectionary.[139] Brazil recently updated its national school lunch guidelines, requiring school meals to eliminate most UPFs and include a minimum of 90% unprocessed and minimally processed food (panel 4).

Evidence suggests that the retail density and types of food outlets around schools can influence students' dietary behaviours and nutritional status.[140,141] Anti-smoking advocates found controlling tobacco around schools was an important approach to reducing youth tobacco use globally.[142,143] We recommend implementing restrictions on sales of UPFs in retail outlets surrounding schools. Food procurement programmes can restrict UPFs not only in schools, but also in public hospitals and health-care settings, child-care settings, the military, and other public institutions. Child care and early-learning environments are especially important settings for future policy intervention, given the high levels of UPF consumption among infants and toddlers reported in many countries.[78,79,144]

Integration of policies

National dietary guidelines

Dietary guidelines are evidence-based recommendations for consumer education, and are used to guide food and nutrition policies.[145] Incorporating UPF-reduction recommendations into national dietary guidelines can support the development of UPF-focused food environment policies (panel 1). When combined with guidance to restrict HFSS foods, this approach can expand the range of harmful food products that populations are advised to avoid, as is the case in India and Chile (among other countries).[146,147] In 2014, Brazil became the first country to advise restricting UPFs in its dietary guidelines.[8] This decision has since influenced national programmes, such as the redesign of food procurement requirements for the nation's school meal programme (panel 4) and a reform of the country's taxation system.[148,149] UPF reduction recommendations are now being included in a growing number of national dietary guidelines.[8,150]

Some critics and industry-backed studies have argued that the term "ultra-processed food" is not easily understood by the general population.[151] However, several Latin American countries have shown a high level of public understanding, and awareness is growing in many high-income countries (eg, in the UK and the USA, where parliament and congress have had hearings on UPFs).[152] We recommend further research into effective social marketing campaigns to raise awareness about the nutritional and health risks associated with UPFs, and support their implementation in dietary guidelines for informing governmental food policy and programmes.[10]

National food policies

Although each of the food environment policies discussed earlier can be effective in isolation, greater

impacts are achieved when multiple policies are introduced and integrated in a coordinated and synergistic way.[35,85,153] Chile's integrated and mutually reinforcing policies built around one Nutrient Profile Model is exemplary (see panel 3).[35] Colombia's new front-of-package warning label for HFSS foods is linked with taxes on sugar-sweetened beverages and UPFs, such that the laws mutually reinforce each other.[154] A key element in achieving policy coherence is the consistent application of clear and standardised definitions of UPFs (as shown in panel 1).

Global dietary guidelines and Codex Alimentarius

Global food and dietary guidance includes reports from the UN that promote environments conducive to effective healthy food policies. Global recognition of key concepts and policy recommendations encourages national authorities to integrate them into food policy and regulatory frameworks. In recent years, WHO and FAO have been incorporating the concept of UPFs into their dietary guidance recommendations. In 2019, FAO published its highly cited report[34] titled *Ultra-processed foods, diet quality, and health using the NOVA classification system*. 5 years later, FAO collaborated with WHO on their joint publication titled *What are healthy diets?*, which discussed UPFs in the context of dietary moderation.[19] WHO, FAO, and UNICEF have recognised the Nova-UPF score as one of four key metrics for monitoring diet quality globally (see also panel 1).[17]

UNICEF has also increasingly acknowledged the health risks associated with UPFs and has integrated this awareness into its global nutrition strategy and policy guidance.[155] In its flagship Child Nutrition Report,[156] UNICEF highlights how globalisation, urbanisation, and marketing have accelerated the consumption of nutrient-poor UPFs among children and calls for urgent transformation of food systems to support healthier diets. Additionally, UNICEF's *Programme Guidance on Engagement with the Food and Beverage Industry* sets a clear stance: the organisation will avoid both financial and non-financial partnerships with companies in the UPF sector. This approach includes excluding UPF manufacturers and marketers from UNICEF-led platforms to uphold its integrity and prioritise child health.[157]

The next step in raising awareness of the dangers of UPFs is for UN agencies to issue clear recommendations to restrict the production, marketing, and consumption of UPFs, building on WHO's technical work on defining UPFs.[19] Embedding this guidance in country-level policy frameworks and standards will make it actionable, and ensure that it influences food environments worldwide. WHO and FAO can convene member states to share best practices and coordinate policy action, creating a coherent international response.

The Codex Alimentarius Commission (Codex) administers the joint FAO and WHO Food Standards Programme, which is responsible for establishing global food standards. Its dual mandate—to protect consumer health and facilitate fair food trade—gives Codex standards substantial influence.[158] Codex standards function as minimum benchmarks for national food standards and as reference points in World Trade Organization agreements. Standards relevant to UPFs include those concerning food composition (eg, use of novel food ingredients), food labelling (eg, display of nutrition claims), and food processing (eg, use of processing aids).[159]

Although Codex has historically focused on acute food safety risks, such as contaminants and toxicity, it has been far less effective in addressing chronic diet-related diseases or environmental harms, including those linked with UPFs. Risk assessments typically evaluate food additives and processing aids in isolation, without considering their cumulative effects and concoctions of additives, or their role in facilitating UPF production and overconsumption. This narrow scope hinders Codex's ability to respond to UPF as a global, diet-related health challenge.[159]

Codex's governance processes also pose barriers. Representatives from the UPF industry often participate in national delegations, raising concerns about conflicts of interest.[160,161] High-income countries, in which many UPF corporations are headquartered, hold disproportionate sway in standard-setting processes, whereas low-income and middle-income countries, and civil society voices representing public health and consumer interests, remain under-represented.[160,162]

Reform is urgently needed to better equip Codex to respond to the global UPF challenge. This reform includes updating Codex's risk assessment frameworks to consider the epidemiological evidence of long-term and cumulative effects on health,[1] strengthening participation rules to address conflicts of interest, and supporting middle-income and low-income countries to engage effectively in Codex processes. More ambitious international standards would enable national governments to act without fear of trade challenges, which would help in making global diets healthier and more sustainable.[159]

Policies for promoting healthy diets and reducing dependence on ultra-processed foods

The growing consumption of UPFs is shaped by both demand-side and supply-side factors. Consumers seek convenient, affordable, and palatable foods. To reverse this rise in UPF consumption, policies should both reduce the availability and consumption of UPFs but also increase the availability, affordability, and appeal of fresh and minimally processed foods, including ready-to-eat and ready-to-heat options.[129] These foods should comply with the definition of healthy diets: those that promote growth, development, and wellbeing while preventing both undernutrition and diet-related non-communicable diseases.[19]

Leveraging public procurement and institutional food programmes

Governments have a key role in shaping access to nutritious foods through public procurement. A notable example is Brazil's national school feeding programme (Programa Nacional de Alimentação Escolar), benefiting more than 40 million children aged 2–18 years, which mandates that 90% of meals be unprocessed or minimally processed, and 30% of ingredients be sourced from local farmers (panel 4). Other examples include Viet Nam's Home-Grown School Feeding programme, which uses school gardens to supply fresh produce,[163] and Mexico's Sin Hambre programme[164] and the unprocessed food pantry initiative in Montana, USA,[165] which support smallholder farmers and improve access to fresh food. Such institutional programmes ensure consistent access to nutritious meals and support local food economies.

Implementing nutrition-sensitive economic policies

Targeted food subsidies and cash-based food transfer programmes—such as vouchers or electronic benefit cards for purchasing fruits and vegetables—can increase access to healthy foods. Funding these through UPF taxation represents a promising fiscal strategy.[124,125] Evidence shows these mechanisms are effective in shifting dietary patterns towards nutrient-dense foods, especially fruits and vegetables.[125]

Empowering local enterprises and community food systems

Support for small and medium food enterprises, including informal vendors and traditional eateries (eg, Mexico's *fondas* and Brazil's *prato feito*) is essential.[27] These businesses provide culturally relevant, affordable, and nutritious food options. In many regions, however, they struggle to compete with low-cost UPFs. In addition to commercial models, community-based approaches—such as communal kitchens and cooperatives—can enhance access to healthy meals, especially in food-insecure areas.[166–168]

Addressing structural inequalities and promoting equity

UPFs are disproportionately consumed by populations affected by economic constraints, gender, and time poverty. Their affordability and convenience make them attractive to people working long hours or living in constrained conditions, or to women, who disproportionately continue to bear the primary responsibility for food preparation in many cultures. Instead of alleviating these burdens, UPFs often reinforce structural inequities by facilitating low-wage labour, not challenging gendered domestic roles, and displacing environmental and social burdens to low-income and middle-income countries.[29,169,170]

Ensuring equitable access to affordable, nutritious, and convenient foods requires confronting entrenched socioeconomic, gender, and racial inequalities that restrict people's access to income, housing, time, cooking facilities, and food preparation skills. Reducing reliance on UPFs demands a cultural shift: valuing domestic cooking, redistributing food-related responsibilities—particularly from women to men—and challenging entrenched gender roles.[171,172]

Beyond the household, food preparation could be reimagined as a collective, communal activity, through models such as community kitchens and shared provisioning. Finally, a notable gap remains in the availability of healthy, time-saving meals that are ready to heat or ready to eat—an area where innovation and policy support are urgently needed.

Policies for manufacturers of ultra-processed foods and fast-food and supermarket corporations

Although many country-specific companies produce UPFs, transnational food corporations are central drivers of their global production, marketing, and consumption (as elaborated in the third paper in this Series).[29,173] These UPF corporations have shaped food environments and supply chains and influenced government policies and scientific evidence.[174–176] In doing so, they drive health impacts associated with high UPF consumption.[177–179] The well documented harms of UPF-based diets, the persistent failure of industry self-regulation, and the structural barriers individuals face in pursuing healthy eating within UPF-dominated environments, underscore the urgent need for strong policy and regulatory action to curb excessive influence from UPF corporations. These corporations include UPF manufacturers, fast-food and supermarket corporations, and grocery retailers whose product portfolios and sales consist of UPFs and whose market and political practices actively promote UPF consumption at the expense of healthy diets.[169]

We urge the adoption of policy innovations that extend beyond regulating specific UPF products or practices to encompass the entire operational scope of UPF corporations—including their brand portfolios, marketing strategies, and sales structures. Some initiatives are already monitoring the nutritional quality and proportion of UPFs in corporate food portfolios.[30,111,180,181] Corporations such as Nestlé, and retailers such as Walmart, have been also tracking the quality of their own food portfolios,[132,182] but they usually choose Nutrient Profile Models that present a more favourable profile of their food products. Similarly, regulatory restrictions on marketing to children have been proposed that would apply to brands rather than their individual products, if that brand is predominantly associated with poor-quality food products.[113] Supermarkets could also be regulated by restricting the proportion of UPFs in their total sales.

These portfolio-based regulations should be complemented by additional measures that address the

broader role of UPF corporations within food systems. These measures, which include rules for direct foreign investment, anti-trust regulations, restrictions on mergers and acquisitions, and interventions to control corporate monopolisation, can help to restrict corporate market share and prevent horizontal, vertical, and global integration—and the economic and political power that comes with it.[33,183–185] To curb excessive corporate profits, and to rebalance and protect governments' fiscal spaces to fund food and nutrition policies, tax obligations should be enforced, along with minimum tax rates as suggested by the UN's proposed global minimum tax.[186] An innovative tax law in Ecuador excludes UPF companies from offsetting their marketing expenditures to reduce their taxable income.[187]

UPF corporations should be held responsible for the negative effects they have on health and the environment.[93] For example, the EU has passed supply-chain laws requiring commodities such as palm oil, soy, and cocoa to be produced in ways that do not lead to deforestation and human rights violations.[188] Analogous to WHO's Framework Convention on Tobacco Control,[26,87] a proposed framework convention on food systems could "strengthen the ability of nations to act, [and] reduce the power asymmetries created by Big Food."[174] In addition, we urge the adoption of policy measures that greatly curtail the substantial political influence of UPF corporations in food governance, public policy making, professional organisations, and academia (further details given in the third paper of this Series).[29]

Policies for food supply chains

The global increase in UPF consumption is closely tied to long-term transformations in national and global food systems, including shifts in agriculture, trade, and environmental policy. These systemic changes have enabled the large-scale production and marketing of cheap UPFs. Although numerous reports and initiatives address broader food system and supply chain reforms,[153,189–194] this Series paper focuses specifically on selected UPF-related issues within that wider context (see also the third paper in this Series).[29]

The growth of UPFs has been fuelled by agricultural systems designed to produce cheap ingredients, such as corn, soy, sugar, and oils, through large-scale, industrial monocultures.[63,195,196] These practices—often subsidised by governments and institutions (eg, the World Bank)[197]—have come at the expense of crop diversity and have harmed farmers' incomes, rural women, and indigenous communities.[198–200]

To counter the dominance of UPF-linked commodity crops, agricultural subsidies and policies should shift towards supporting diverse, locally oriented food production. In low-income and middle-income countries, building demand and addressing infrastructure gaps—such as storage and marketing—are essential.[201,202] Public procurement programmes can help to stimulate local agriculture and supply minimally processed foods to public institutions (panel 4).

International trade policies and agreements have enabled the global spread of transnational food and supermarket corporations, accelerating UPF production, marketing, and trade.[203,204] Powerful countries (eg, the USA) and the EU have used these mechanisms to challenge other nations' food and health regulations, contributing to a negative impact on countries' considerations of food policies.[205,206]

Reforming international trade rules can help countries implement policies that reduce UPF sales and curb the power of transnational food corporations. Experts recommend incorporating public health exceptions, restricting investor protections, removing investor–state dispute mechanisms, and safeguarding domestic agricultural markets.[207] Codex standards could also be used to reinforce such trade protections.

The expansion of UPF production has had major ecological consequences. Manufacturers rely on cheap, globally sourced raw materials but face minimal environmental accountability.[208,209] Compared with locally prepared, minimally processed foods, UPFs contribute more heavily to climate and ecological harm, through intensive ingredient sourcing, excessive plastic packaging, and high water use in production (eg, by beverage companies).[210–215] These environmental burdens disproportionately affect low-income and middle-income countries.[216]

Robust environmental policies can help curb UPF production by targeting the industry's unsustainable use of resources and pollution. Measures such as taxes on single-use plastics (as seen in Germany and Colombia), restrictions on packaging, and water-use regulations, are promising tools.[217] Environmental and nutrition policies should also be aligned, for example, by prohibiting UPF companies from using greenwashing or sustainability claims that mislead consumers.[208,218,219]

Conclusion

To address the global rise in UPFs, coordinated policies are needed across national and global food systems. Although policies targeting HFFS foods are important, given that a sizable proportion of UPFs are also HFSS, a broader approach to UPFs is needed. Expanding current food environment policies is crucial, but addressing other sectors of food systems, particularly those targeting UPF corporations given their market and political influence, is also essential. This Series paper presents a transformative agenda to reduce and prevent the rise of UPFs, focusing on regulating food environments and corporate practices. We also emphasise the need for policies that ensure the availability and affordability of minimally processed foods, particularly for vulnerable groups with less capacity to shift back to healthier diets. These innovations should be integrated into broader food systems transformations aimed at achieving healthier, more sustainable diets.

Food systems have evolved to prioritise the production, marketing, and consumption of UPFs. Reversing this trend will be a long-term process, requiring targeted food system policies alongside broader socioeconomic reforms to address the inequalities and power dynamics that have fuelled the supply and demand for UPFs. Given the substantial impact of UPFs on dietary quality and food systems, defining a clear, actionable agenda with a committed set of policies and interventions aimed at creating meaningful change, is both essential and urgent.

Contributors

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