Systematic Review

Identifying barriers and facilitators in the development and implementation of government-led food environment policies: a systematic review

SeeHoe Ng, Heather Yeatman, Bridget Kelly, Sreelakshmi Sankaranarayanan, and Tilakavati Karupaiah

Context: *Policy-specific actions to improve food environments will support healthy population diets.* ***Objective:*** *To identify cited barriers and facilitators to food environment policy (FEP) processes reported in the literature, exploring these according to the nature of the policy (voluntary or mandatory) and country development status.* ***Data sources:*** *A systematic search was conducted of 10 academic and 7 grey-literature databases, national websites, and manual searches of publication references.* ***Data extraction:*** *Data on government-led FEPs, barriers, and facilitators from key informants were collected.* ***Data synthesis:*** *The constant-comparison approach generated core themes for barriers and facilitators. The appraisal tool developed by Hawker et al. was adopted to determine the quality of qualitative and quantitative studies.* ***Results:*** *A total of 142 eligible studies were identified. Industry resistance or disincentive was the most cited barrier in policy development. Technical challenges were most frequently a barrier for policy implementation. Frequently cited facilitators included resource availability or maximization, strategies in policy process, and stakeholder partnership or support.* ***Conclusions:*** *The findings from this study will strategically inform health-reform stakeholders about key elements of public health policy processes. More evidence is required from countries with human development indices ranging from low to high and on voluntary policies.*

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INTRODUCTION

Poor diets are a major contributor to chronic diseases globally.[1] Trade liberalization pertaining to unhealthy foods, coupled with extensive distribution, marketing, and affordability of food, contributes to population nutrition transitions that promote obesity and chronic diseases.[2] Such food system activities trigger reduced consumption of fruit and vegetables concomitant with high intakes of sugar-sweetened beverages (SSBs), fast

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foods, and other ultra-processed foods.[1,3] These diets are associated with elevated dietary risks for obesity and non-communicable diseases (NCDs).[1,3,4] Notably, trends in increased availability and consumption of foods high in sodium, fat, and sugar are observed in middle-income countries[5–6] with the displacement of traditional diets.

The need to bring about systemic changes within food environments to address nutrition, obesity, and diet-related NCDs is gaining critical attention.[5,7–10] Swinburn et al.[11–12] define food environments as the collective physical, economic, policy, and sociocultural surroundings, opportunities, and conditions that mediate food systems and shape individual diets. Elements of food environments include food composition, labelling, promotion, prices and availability, food provision in schools and other settings, as well as trade policies.[13–14] Additionally, Turner et al.[15] include the personal domain, with accessibility, affordability, convenience, and desirability of food sources and products in the matrix of people's food acquisition and consumption within the food system. Overall, the goal of forging a positive and sustainable food environment is to enable a healthy food supply that is accessible, affordable, and marketed.

Governments have definite roles and obligations to create, enable, and sustain healthy food environments.[14] Government-led food environment policies (FEPs) may comprise voluntary or mandatory approaches. Such policies could be guidelines, directives, bills, court decisions, regulations, laws, or acts.[16] But governments may be challenged when prioritizing public good over commercial interests.[6] For instance, the proposed policy to introduce an SSB tax in New York was unsuccessful because of heavy resistance from the food industry.[17] In addition, the government in Denmark was legally challenged by the European Union Commission when attempting to introduce standards for limiting *trans*-fat food content, because this was perceived to be obstructing the free movement of goods.[18] Therefore, a better understanding of FEP processes is crucial to achieving relevant public health benefits.

Benefits to public health can be achieved through implementation of FEPs in specific domains.[19–23] For example, a systematic review showed food labelling and setting limits for *trans*-fat content in foods produced the desired effect of significantly reducing *trans*-fat levels of the food supply in 7 countries.[21] Furthermore, statutory regulations can reduce the volume and exposure of children to advertising of high fat, salt, and sugar foods,[19] and imposition of at least a 20% tax on unhealthy foods could decrease population consumption of such foods and beverages.[23] In contrast, trade agreements that do not prioritize health concerns are associated with increased consumption of ultra-processed foods and SSBs.[24] Proper planning and effective policy implementation, therefore, would benefit targeted groups, such as children, or the whole population.

Government-led FEPs that focus on public interest and population health should underpin healthy, equitable, and sustainable food systems. Until now, to our knowledge, there have been 3 systematic reviews[25–27] that have examined barriers and facilitators related to food policies. However, these reviews did not specifically analyze government-led FEPs.[25–27] These reviews either did not focus on FEPs[25] or were related to specific food environment elements and processes, such as food service industry implementation of menu-labelling policies[26] and school-based food and beverage policies.[27] Swinburn et al.[6] posited that identifying elements and mechanisms required to prevent policy inertia are critical to propel action on the development and implementation of FEPs. In this review, therefore, we addressed the following research question: *What are the key elements in policy processes that lead to or impede government-led FEPs to prevent obesity and diet-related NCDs?* The aim of this study was to systematically review the literature on the barriers and/or facilitators cited by key informants during the development and implementation processes of FEPs considered critical to reducing dietary risks related to obesity and chronic disease prevention. We further aimed to segment the findings according to policy characteristics and country development levels. The findings will assist health-reform stakeholders (eg, policy makers, academia, health professionals and civil society organizations) to understand challenges in policy development and implementation to prevent obesity and diet-related NCDs, maximizing opportunities to advance FEPs in the future.

METHODS

The systematic review protocol was registered with the PROSPERO International Prospective Register of Systematic Review (no. CRD42018115034). This review article follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) reporting guidelines.[28]

Search strategy

The systematic search was initiated in October 2018 with a final update in January 2021 through Web of Science, Scopus, ProQuest Central, SAGE journals, PsycINFO, Emerald Journals and Case Studies, Business Source Complete, Medline, AGIS Plus Text,

and China National Knowledge Infrastructure databases. The search strategy was aimed at title, abstract, or keywords of articles with the following Boolean search string: ("food" OR "beverage" OR "food environment") AND ("polic*" OR "action*" OR "code*" OR "regulation*" OR "law*" OR "initiative*" OR "legislation*") AND ("obesity" OR "nutrition" OR "public health" OR "non-communicable disease*") AND NOT ("alcohol" OR "tobacco" OR "agricultur*" OR "drug*"). When the search yielded >500 articles, an additional Boolean search string [AND ("facilita*" OR "support*" OR "assist*" OR "enabl*" OR "imped*" OR "obstruct*" OR "hinder" OR "halt" OR "prohibit" OR "barrier*")] was applied. The exclusion cutoff of 500 papers allowed better article matching with the research topic and was the approach used by Cullerton et al.[25], who explored factors impeding and facilitating changes in nutrition policies. Articles and other sources were included if they were published between January 1988 and January 2021. Table S1 in the Supporting Information online details search strings on the Web of Science database.

Additional website searches were conducted for agencies such as the Rudd Center for Food Policy and Obesity, United Nations Development Program, Bill & Melinda Gates Foundation, International Food Policy Research Institute, World Health Organization (WHO), International Network for Food and Obesity/Noncommunicable Diseases Research, Monitoring, and Action Support (INFORMAS), and World Policy Analysis Center. These websites were selected on the basis of citations in policy analysis publications and/or agencies that had published healthy food policies. Government websites were also screened using the Google Advanced Search (eg, ".gov.my" for Malaysia; ".gov.au" for Australia). Table S2 in the Supporting Information online outlines the screened websites ($n = 45$) of the governments or countries. Furthermore, following the method of Horsley et al.[29], the reference lists of selected publications comprising similar reviews[25–27] and academic articles[30–32] were examined manually to supplement the electronic search. These 9 additional searches are referred to as "other sources" in Figure 1.

Study selection

We included in this review publications that reported on 2 key areas. First, government-led FEPs were assessed by policy domains as defined by the Food Environment Policy Index (Food-EPI).[14] The FEP domains included food composition, labelling, retail, price, promotion, provision, and trade and investment, which comprise subsets of the food system. Studies were included if they reported on any of these FEP domains.[14] Articles were then assessed for their inclusion of information on barriers and/or facilitators during policy processes, concerning either policy development or implementation. For publications reporting on the policy development stage, only formative policy research tied to a government's explicit intention to implement such a policy (eg, stated in the national plan; agreement or approval from the Parliament) were included. We also included in the review, articles providing an insider perspective describing the policy process. To qualify as an eligible insider perspective publication, information had to be available on the authors' affiliation(s) and/or declaration of conflicts of interest, either directly or indirectly (through agencies) with involvement of the author(s) in the policy process. This publication was typically a commentary piece, reporting insider views on the policy development and/or implementation process, consistent with the research question of the present review. Also, articles published in all languages were included.

Studies were excluded if they reported public opinions unrelated to the policy processes (eg, general parental perceptions or students' views on the investigated policy), hypothesized policy explorations without governmental commitments to enact or implement, and/or were articles with only general recommendations to policy makers. Also excluded were studies reporting policies covering the tertiary health system, communicable diseases, food safety and functional food topics (eg, food additive and preservative, genetic modified foods, allergen, bioactive compounds), undernourishment issues (eg, food fortification), alcohol, tobacco, food and agriculture (eg, crop yield, pesticides), environmental issues (eg, greenhouse effect), and physical activity. Finally, studies were excluded if results on barriers to and/or facilitators of FEPs could not be separated from other policy areas; and articles with a focus on protocols, commentaries, proceedings, noninsider reviews, poster abstracts, book reviews, or letters.

Title and abstract of the identified articles were first checked for relevance and the full-text articles were subsequently assessed against inclusion and exclusion criteria by 2 reviewers (S.H.N. and S.S.N.). Eligible studies were those that met the aforementioned inclusion criteria (Table 1).

Figure 1 illustrates the PRISMA flow chart of the systematic review literature search. When there were discrepancies, another reviewer's opinion (either H.Y., B.K., or T.K.) was sought for final resolution through discussion.

Data extraction

Data were extracted by 1 reviewer (S.H.N.) from eligible articles, and uncertainties were resolved through

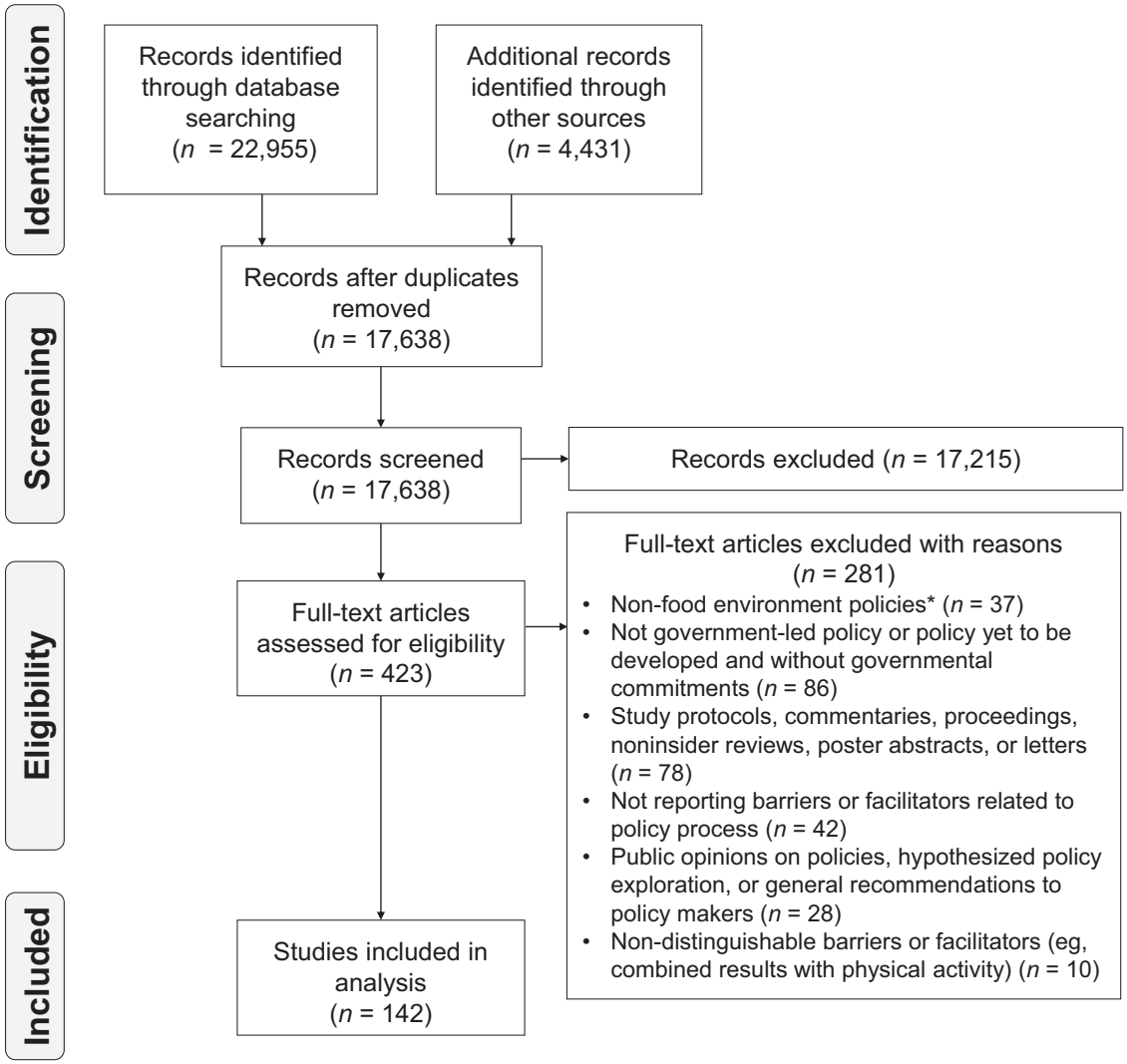

Figure 1 **PRISMA flow chart of the systematic review literature search.** **Food environment policies included food composition, food labelling, food retail, food prices, food promotion, food provision, and food trade and investment domains as defined under the policy component of the Food-Environment Policy Index, developed by the International Network for Food and Obesity/Non-communicable Diseases Research, Monitoring, and Action Support (INFORMAS).*[14]

discussion with other reviewers (H.Y. or B.K.). Data extraction included 1) article information (eg, years of data collection and publication, author, research design, participant characteristics, perspective of results such as the government, industry, civil society); and 2) policy information (eg, country, country development status, food-environment domains based on Food-EPI,[14] policy name, policy nature [eg, voluntary or mandatory approach], target group [eg, population, children, workplace], level of policy enactment [eg, national or subnational level], stage of the policy process [eg, development or implementation]). Country development status referred to the Human Development Index (HDI) and World Bank classifications. The HDI is derived from life expectancy, education, and gross national income indices, categorizing countries into low (<0.550), medium (0.550–0.699), high (0.700–0.799), and very high (≥0.800) levels.[33] The World Bank classification uses gross national income per capita to differentiate countries into low-, lower-middle-, upper-middle, or high-income levels.[34] Both classifications were determined on the basis of the year closest to the data collection, as reported by the authors. If this information was unavailable, the year of publication was used. For the purpose of this review, a mandatory approach refers to a policy that imposes a legal obligation or directive order that compels implementation (with or without a penalty for non-compliance). In contrast, a voluntary approach denotes a policy for which implementers or relevant agencies have a choice on its uptake, without any legal obligation or directive order.

Table 1 **PICOS criteria for inclusion and exclusion of studies**

Parameter	Inclusion criteria	Exclusion criteria
Participants	Key informants who could contribute information on the policy processes (eg, insiders involved in the policy process, policy implementers, relevant stakeholders from the government, industry, and civil society)	Public not involved in, or privy to, the policy processes (ie, public opinions unrelated to the policy processes, such as general parental perceptions or students' views on the investigated policy)
Intervention/exposure	Government-led food-environment policies to prevent obesity and diet-related noncommunicable diseases that fulfill 2 key areas: • They span the domains set out in the policy component of the Food-Environment Policy Index and • They focus on barriers and/or facilitators during the food-environment policy processes.	• Policy exploration without governmental commitments to enact or implement • Policies relating to tertiary health system, communicable diseases, food safety and functional food topics, undernourishment issues (eg, food fortification), alcohol, tobacco, food and agriculture (eg, crop yield, pesticides), environmental issues (eg, greenhouse effect), and physical activity • Barriers to and/or facilitators of food environment policies that could not be separated from other policy areas (eg, physical activity)
Comparator	Not applicable	Not applicable
Outcomes	The barriers and facilitators of food-environment policies: 1. during the development and implementation processes and 2. per policy characteristics (mandatory *vs* voluntary policy) and country development status (low- to high-HDI countries *vs* very-high-HDI countries)	None
Study design	Qualitative and/or quantitative research (including insider perspective publications)	Protocols, commentaries, proceedings, non-insider reviews, poster abstracts, book reviews, letters, and general recommendation articles to policy makers

For each eligible article, data relating to barriers and/or facilitators were identified through line-by-line screening in the *Results* or *Findings* section (excepting insider perspective publications that did not have this article structure) and then extracted unedited to a Microsoft Word file. For non-English publications, relevant information was translated by a native speaker (S.H.N., for the Chinese language) and/or Google Translate. Notably, Jackson et al.[35] recommended that Google Translate could be used to retrieve data from non-English literature such as Chinese, Korean, Spanish, and German languages for systematic reviews, with agreement reaching at least 85%.

Thematic analysis[36] was performed by 1 reviewer (S.H.N.) by constructing subthemes with corresponding descriptions summarized from the primary data. This analytical process allowed the interpretation of large, qualitative datasets and generated common patterns of barriers and facilitators during the policy processes. The results were charted using pro forma matrix tables in Microsoft Excel. The process was first pilot tested on a subset of articles with further subtheme modification during data extraction. This involved reading (by S.H.N.) through the articles line-by-line and coding the data[25,37] on the basis of the established subthemes. New subthemes were derived when the information did not fit with the available themes. To further ensure quality extraction, a second reviewer (H.Y.) verified approximately 10% of eligible studies[38] to provide guidance and minimize interpretative differences, focusing on those articles for which extraction was more complex (eg, insider perspective publications and when multiple policies were discussed in an article). Consensus on extraction issues such as thematic coding was reached through discussion with review members, with no major extraction discrepancies. For the remaining articles, a third opinion (H.Y., B.K., or T.K.) was sought to reach the final consensus when uncertainties occurred.

Quality appraisals

By pilot testing relevant appraisal tools applied to the eligible studies, we found the model developed by Hawker et al.[39] provided the best fit for this review, allowing appraisal (by S.H.N.) for both qualitative and quantitative studies. This appraisal tool compared articles against 9 items: abstract and title; introduction and aims; method and data; sampling; data analysis;

ethics and bias; results; transferability or generalizability; and implications and usefulness. Each item was scored from 1 to 4 points (total: 36 points) and the quality classification was consistent with the rating by Lyons et al.[40]: "high" (≥28 points), "fair" (19–27 points), "poor" (9–18 points), and "very poor" (<9 points). However, most of the appraisal tool's items were not applicable to the insider perspective publications, for which quality appraisal could not be performed. A second reviewer (H.Y.) verified approximately 10% of eligible studies for data accuracy and consistency. No meaningful disagreements in quality points between reviewers were identified, with both reviewers' ratings corresponding to the same quality categories.

Data synthesis

The dataset comprised the primary data and reviewer interpretations generated from the thematic analysis. When all eligible studies were scrutinized, with no further generation of new subthemes, a second narrative reading was conducted. Blaschke[37] applied this data synthesis method, with the rationale to confirm coding consistency for all eligible articles. Later, through a constant-comparison approach,[36] subthemes with common attributes were grouped together to form core themes for barriers and facilitators. Synthesis of the data was primarily based on simple vote counting of the number of cases for policy development and implementation, as well as the characteristics extracted from the policy information. For the latter, cases were assigned to groups, including the characteristics of policy (ie, mandatory *vs* voluntary approach) and country development status (ie, low- to high-HDI countries *vs* very-high-HDI countries). HDI combined 3 dimensions of life expectancy, education, and gross national income[33]; therefore, this classification was primarily used in data synthesis for country development status. For countries without HDI data (ie, Nauru, French Polynesia, and Puerto Rico), World Bank classification (low- to middle-income *vs* high-income countries) applied.

The overall top-cited barriers and facilitators (herein termed "overall cases") were generated by separately ranking case counts of the subthemes for policy development and implementation. Data analyses considered the 5 top-cited barriers and facilitators when considering variations by the nature of the policy and country development status (termed "investigated characteristics"). In some instances, more cited barriers and facilitators were considered when ranked equally high.

RESULTS

In total, 22 955 records were found through academic database searches and another 4431 records were retrieved from other sources (Figure 1). After removing duplicates and screening titles and abstracts, 423 full-text articles were reviewed before narrowing down the list to 142 eligible studies that met the inclusion criteria.

Description of eligible studies and cases

The 142 eligible studies in the final analysis covered perspectives of governments ($n = 74$ studies), industry ($n = 71$), civil society ($n = 44$), and other stakeholders ($n = 59$) such as policy implementers. An increasing temporal trend was observed for studies reporting barriers and facilitators during the development and/or implementation of government-led FEPs (Figure 2). Prior to 2009, there was scarce reporting (<5 studies/year or <10 studies overall) on the investigated topic, compared with more frequent reporting in the most recent decade, with the publication rate peaking at 18 studies in 2020.

Government-led FEPs were identified according to the INFORMAS domains[14] of food composition, label, promotion, retail, provision, prices, and trade and investment domains (Table 2). School policies ($n = 66$); so-called sin tax ($n = 17$) that mainly linked to SSBs; and restriction on unhealthy food advertising ($n = 11$) were topics frequently explored in the literature.

Most studies ($n = 86$) applied ≥1 qualitative research methods such as observations, document reviews, focus-group discussions, and interviews. Of those using quantitative approaches, 13 studies applied questionnaires, and 24 studies combined questionnaires with qualitative research methods. Nineteen studies were identified as insider-perspective publications. These were excluded from the quality appraisal. For the remaining eligible studies ($n = 123$), the scores for quality appraisal ranged from 13 to 34. The majority of studies were classified as fair quality ($n = 72$), followed by high ($n = 47$) and poor ($n = 4$) quality. Table S3 in the Supporting Information online summarizes details of the 142 eligible studies.

Eligible studies varied in terms of reporting on ≥1 FEP domains and relating to single or multiple countries (Figure 3). This led to a pool of 193 policy cases (across domains and countries) identified from the 142 studies. Most of the 193 cases investigated policies that targeted the whole population ($n = 112$), followed by children ($n = 77$) and the workplace ($n = 4$). There were more cases reported for national policies ($n = 124$) compared with policies at the subnational level ($n = 66$), federal settings only ($n = 2$), and mixed levels of enactment ($n = 1$). Specific to FEPs in settings, 80 cases examined policies either at schools or workplaces, and 42 of those were related to subnational policy development.

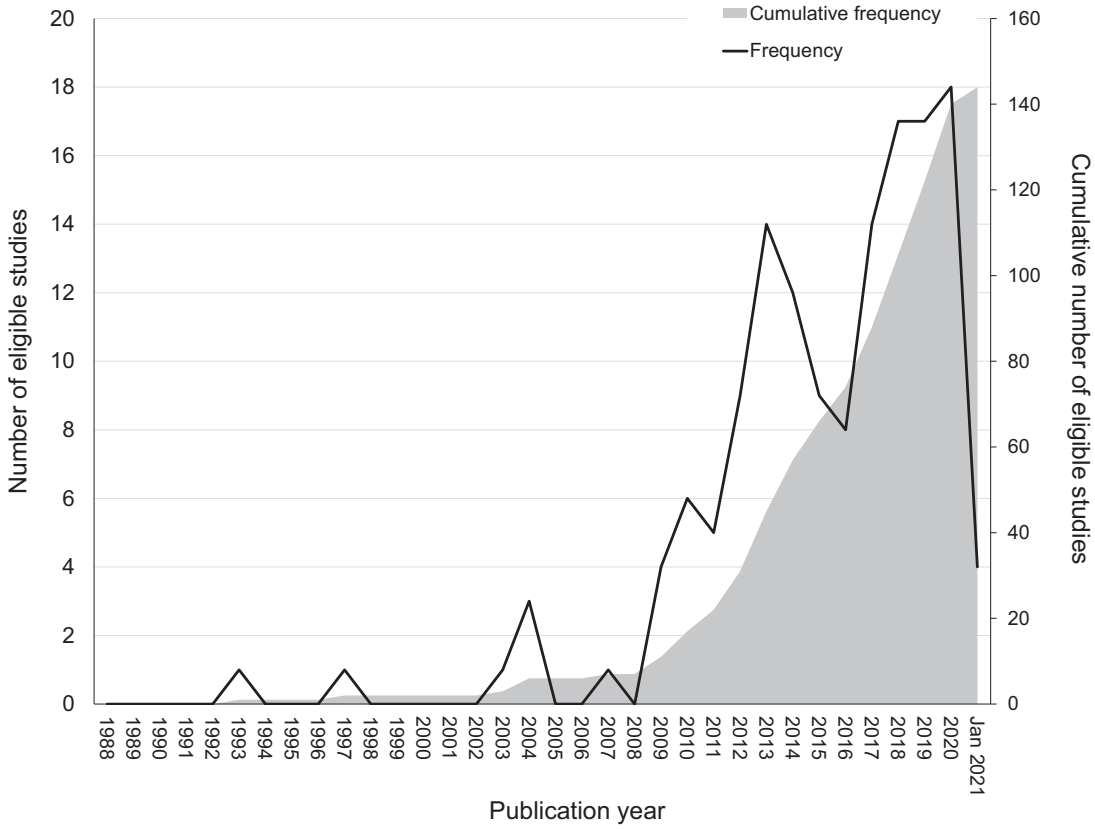

Figure 2 **Eligible studies by year.** A total of 142 eligible articles were identified. Monitoring reports[146–148] published in 2015, 2016, and 2017 by the Ministry of Education of the People's Republic of China were considered as one eligible study

The pool of policy cases was further separated into policy development ($n = 93$) and policy implementation ($n = 130$). The food prices domain contributed the most cases for policy development ($n = 24$ of 93), whereas the food provision domain was emphasized in relation to policy implementation ($n = 64$ of 130). In contrast, food retail, promotion, and trade and investment domains each recorded <10 cases in both policy development and implementation.

In the subanalyses regarding the policy nature characteristic (ie, mandatory *vs* voluntary approach), 12 cases were excluded because they were formative research with policies yet to be developed. Thus, of the 81 cases examining policy development, 74 cases explored mandatory policies and 7 cases investigated voluntary policies. For policy implementation, 2 cases were excluded for policy nature characteristic analysis, because of insufficient information or lack of distinguishing barriers and facilitators. This left 128 cases examining policy implementation, which reported more on mandatory ($n = 98$) than voluntary ($n = 30$) policies.

Policies originated from 39 countries (Figure 4), with more than two-thirds from the United States ($n = 64$ cases), followed by Canada ($n = 17$), Fiji ($n = 16$), Australia ($n = 14$), Mexico ($n = 11$), and Chile ($n = 9$). Very-high-HDI countries contributed the majority of the cases in both policy development ($n = 54$ of 93) and implementation ($n = 89$ of 130). A pairwise matching of country development status in this review revealed that almost all very-high-HDI countries were high-income countries (except 2 cases from Argentina), and all low- to high-HDI countries were low- and middle-income countries (LMICs).

Common themes for the development and implementation of FEPs

Thematic analysis identified 7 common themes, each with subthemes, for the development and implementation of FEPs. Details of the themes and subthemes with definitions are indicated in Table 3.

The *Development of FEPs* section that follows describes specific barriers and facilitators (subthemes indicate as an *italic* format in the following sections to ease reading) occurring with policy development, followed by those relevant to the policy implementation phase. For each phase, the barriers most cited across all the cases (ie, overall cases) are presented, followed by an exploration of comparisons of overall cases with the investigated characteristics as per policy nature and

Table 2 **Domains and topics explored in the eligible studies**

FEP domain	Topic
Food composition	Reductions of *trans*-fat ($n = 8$), salt ($n = 6$), and other nutrients of concern ($n = 1$)
Food label	Nutrition and related labelling ($n = 9$), front-of-pack labelling ($n = 10$), and menu labelling ($n = 10$)
Food promotion	Restriction on unhealthy food advertising ($n = 11$)
Food retail	Healthy and unhealthy food zoning and its infrastructure support (eg, Green Cart permit, expansion of healthy retailers or fresh markets, financial loan) ($n = 8$)
Food provision	Schools ($n = 66$) (eg, Alberta Nutrition Guidelines for Children and Youth in Canada [$n = 4$]; National School Lunch Program [$n = 2$], Child and Adult Care Food Program [$n = 4$], and Healthy, Hunger-Free Kids Act of 2010 [$n = 4$] in the United States; Nutrition Improvement Program for Rural Compulsory Education Students ($n = 6$) in China; and School Nutrition Program ($n = 3$) in Brazil) and other settings ($n = 7$) linked to hospital, recreation and sport settings, and worksite cafeteria
Food prices	Unhealthy food tax (eg, SSB) ($n = 17$), Supplemental Nutrition Assistance Program and its related policies ($n = 5$), fiscal interventions ($n = 4$) linked to farmer's market and farm to school
Food trade and investment	Setting import limits, standards, or ban on unhealthy foods ($n = 3$)

Abbreviations: FEP, food environment policy; SSB, sugar-sweetened beverage.

HDI country status. A similar approach was applied to the *Exploration of Facilitators* section.

Development of FEPs

Exploration of barriers. In terms of policy development, barrier subthemes ($n = 3$ of 5) mostly linked to the policy commitment theme (Table 4) that denoted the preparation and dedication of stakeholders to policy action. The remaining barrier subthemes were the policy governance theme, referring to the management process of the policy cycle; and the industry theme, describing industry response and related issues in policy processes.

Industry resistance or disincentive was the most cited barrier. This is interpreted as industry opposition arguments, related undermining strategies and actions and/or unpleasant experience by the industry that discouraged policy adoption. This frequently occurred when the development of FEPs concerned food labels, restriction of unhealthy food promotion, and food prices specific to unhealthy food taxes. Industry viewpoints also frequently invoked freedom of choice and/or personal responsibility,[41–45] technical feasibility issues,[41,44,46–48] and cost or economic barriers[43,49–52] that disincentivized them from supporting the policy development. Techniques adopted by industry to influence the development of policies were usually cited as lobbying,[17,42,45,49,52–61] pressuring policy makers or governments,[53,54,62,63] filing a lawsuit,[64–65] and mobilizing support from key stakeholders or grassroots campaigns to act against the policy development.[43,45,53,66–68] For instance, in the Philippines, a food industry body lobbied with policy makers from the Department of Education to withdraw the SSB ban in schools.[53]

Lack of resources was the second most cited barrier in FEP development, and denotes the absence or insufficiency of resources related to finance, time, evidence, infrastructure, training, human capacity, and skills. This barrier was cited frequently in cases describing the development of policies related to food labelling, promotion, and provision. A major constraint was limited local or international evidence for policy reference.[41,42,51,53,54,56,60,62,69–73] For example, this was observed in Chile when attempting to define unhealthy foods during the development of the National Law of Food Labelling and Advertising. Other cited constraints included inadequate human resources,[54,74,75] lack of funding,[46,49,52,60,74,76,77] and insufficient time for administration.[47,64,68,74,78] Specific to infrastructure constraints, these were often linked to food provision policies. For instance, the lack of canteen facilities for schools in the United Kingdom was identified as a barrier to preparing healthy school lunches.[76]

The third most cited barrier was *complexity* in policy processes, which is interpreted as difficulties related to administrative processes, conflicting mandates, interests or goals, and changes in macrolevel environments. Some studies reported that the FEP development was compromised by competing interests,[48,52,54,71,74,76,78,79] such as those that reduced revenue as a result of limiting fundraising activities or vending machine sales of unhealthy foods and inequality in trade. Legislative difficulties[42,47,56,64,66,72,80] added to the complexity, as reported for Estonia, where the development of an SSB tax required regulatory approval from the European Commission.[66] In tandem, a major proportion of cases citing the *complexity* barrier in this systematic review concerned FEP domains relating to food retail and trade and investment.

Lack of political will refers to the absence of, or poor, political desire to enable a policy to progress. This was the fourth most cited barrier and was commonly affected by jurisdictional shifts,[41,42,46,47,56,61,80–82] such as

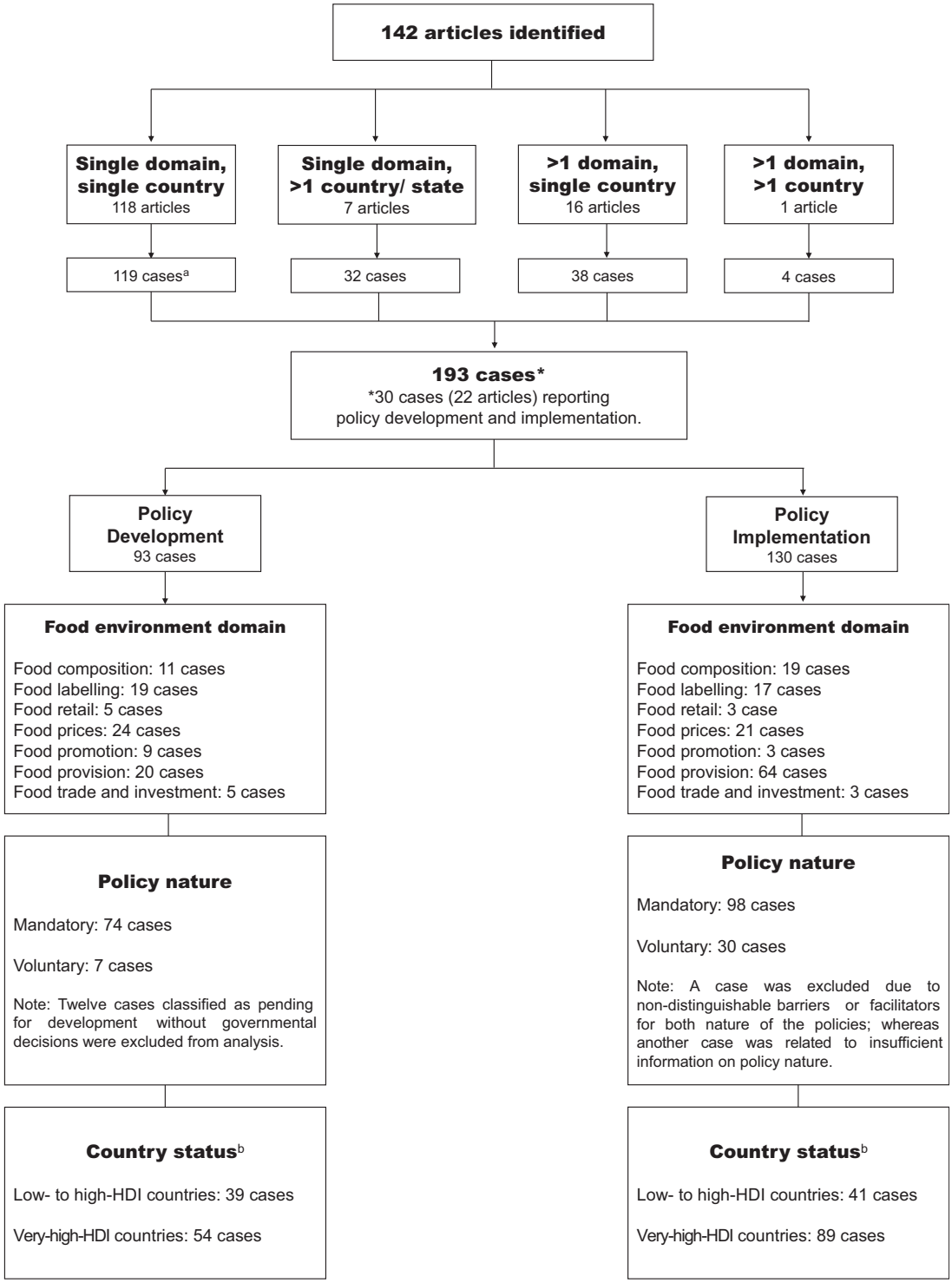

Figure 3 **Cases derived from eligible articles, according to food-environment domain, policy nature, and country income levels.** *Abbreviation*: HDI, Human Development Index. [a]An article investigated a policy with both mandatory and voluntary results; thus, the article was considered to report on 2 cases. [b]Two cases from policy development and 3 cases from policy implementation applied World Bank country income data for country development status, because there was no HDI information.

political change and governance restructuring. On the other hand, the fifth most cited barrier—*implementer characteristics* describes nonpolicy-friendly characteristics linked to perception and concern, business capital, attitude, and/or routine practice of the implementers. Cited characteristics related to this barrier were fear of consumer rejection, concerned business growth interruption, perceived changes beyond the mandate or not necessary, and pessimism about the reforms.[52,53,70,71,74,76,78,80,82–86] Most cases citing *lack of*

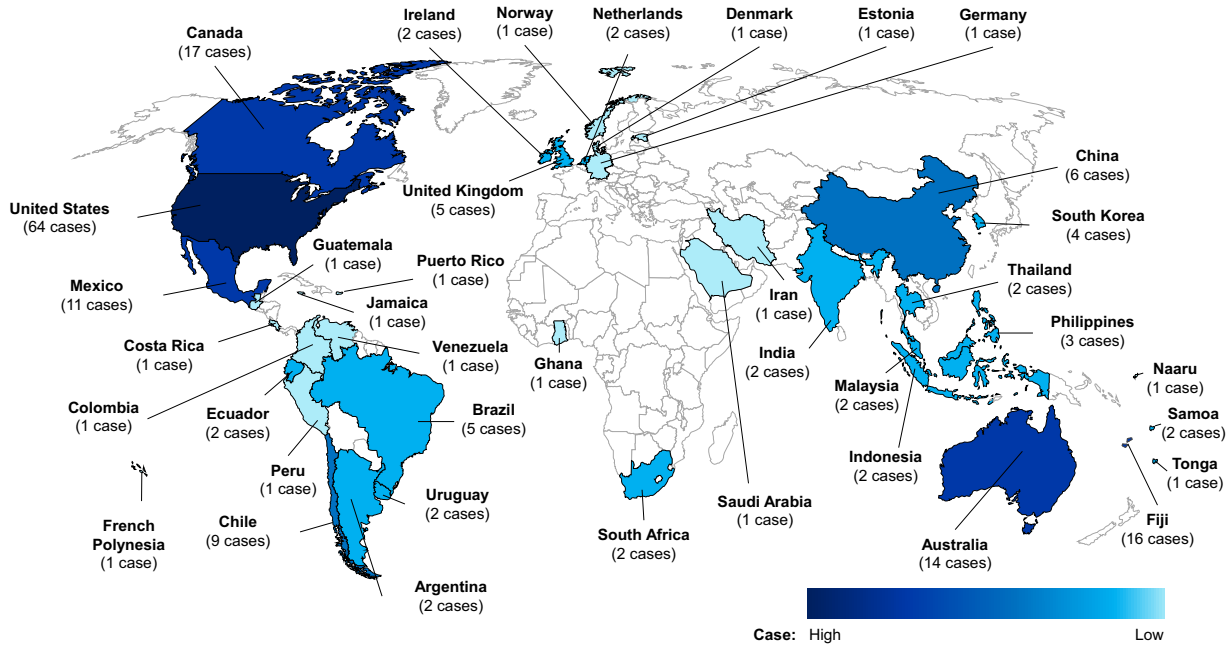

Figure 4 **Geographic distribution of the eligible studies, by cases.**

political will and *implementer characteristics* related to the FEP domain of food provision. These barriers were also dependent on differing policy interests of government sectors within a country. This was observed in Chile, where the Ministry of Economics sided with industry and raised concerns over potential negative effects on employment and the economy if introducing the SSB tax.[65]

Mandatory *vs* voluntary policy arrangements- Overall, more studies examined mandatory policies than voluntary policies. *Industry resistance or disincentive* remained the most cited barrier, irrespective of the policy nature. Identified barriers were similar for both mandatory and voluntary policy arrangements. *Lack of sustainable efforts* was identified as one of the most cited barriers only for voluntary policies and may be interpreted as an inability to pursue policy actions and related factors. This was observed for the state of Louisiana in the United States, when governance change incurred loss of advocates, which impeded the development of the New Orleans Fresh Food Retailer Initiative.[81]

Country development status- There was a similar pattern of barriers across categorization by HDI country status. *Industry resistance or disincentive* remained the most cited barrier, irrespective of the setting being low- to high-HDI countries or very-high-HDI countries.

Exploration of facilitators. With regard to facilitators enabling policy development, 2 out of 5 subthemes related to the policy commitment theme (Table 4). The policy governance theme was the most noted among cases. Other themes were the opportunistic advantage theme, which explains favorable chances to advance policy progress, and the external to policy organization theme, which deals with stakeholder interactions and related issues.

Amongst facilitator subthemes, the *strategies in policy process* identified approaches of stakeholders to move the policy process forward. It was the most cited facilitator for developing FEPs, with most focusing on food composition and labelling policies. Policy framing[18,41–43,45,47,51,52,56,57,59,64,67,71,73,75,85–88] was a frequently cited strategy and often linked to nonhealth applications or outcomes of the policy. For instance, the SSB tax was framed to finance preschools[64,89] or provide potable water[55] in schools; policies to limit *trans*-fat were framed to target corporate behaviours[45]; and bylaws restricting fast-food drive-through restaurants were set to protect the local economy or promote safety.[87] Advocacy through media use[42,43,46,55,63,79,82,89,90] and negotiating with stakeholders[41–43,50,51,63,64,70,84,91,92] to allow flexible grace periods for full policy compliance[42,50,51,92,93] were other strategies frequently cited to promote policy progress. This was exemplified in the case of Argentina when it initiated a mandatory regulation limiting *trans*-fat content in 2008 with full compliance required by 2014.[42] In other cases, policy makers have considered applying stepwise approaches to stage policy implementation and administrative restructuring to facilitate the development of FEPs.[51,72,73,80]

Resource availability or maximization was the second most cited facilitator subtheme. This facilitator is interpreted

Table 3 **Themes and subthemes of barriers and facilitators of food-environment policy identified from cases**

Theme (Definition)	Barrier subthemes	Definition	Facilitator subthemes	Definition
Policy commitment (Preparation and dedication of stakeholders to policy actions)	Lack of leadership	Absence or inadequate individual and organizational leaders, as well as the federal government to pursue policy actions	Leadership	Leaders with the ambition to promote policy actions
	Lack of political will	Absence of or poor political desire to promote a policy		
	Lack of sustainable efforts	Inability to pursue policy actions and related factors	Perseverance in action	Ability to persist in the attempts and related policy actions
	Lack of resources	Absence or insufficiency of resources related to finance, time, evidence, infrastructure, training, human capacity, and skills	Resource availability or maximization	Existence or optimization of available resources linked to former experience and advantages prior to policy adoption, finance, time, evidence, infrastructure, training, human capacity, skills, and interpersonal network
	Implementer characteristics	Nonpolicy-friendly characteristics linked to perception and concern, business capital, attitude, and/or routine practice of implementers	Positive perceptions or attitudes	Favorable values, beliefs, and views by stakeholders or implementers to promote policy actions
			Supportive organizational action	Organizational conditions and related actions that are supportive of policy adoption
Policy governance (Management process of the policy cycle)	Complexity	Difficulties related to administrative process; conflicting mandates, interests, or goals; and changes in macrolevel environments	Strategies in policy process	Approaches of stakeholders to promote policy process
	Lack of monitoring	Absence of or limited routine monitoring to determine policy effectiveness and compliance	Monitoring and accountability system	A system to evaluate policy progress and impacts and hold stakeholders or agencies to account for the policy inaction
	Lack of accountability	Absence or poorly defined mechanism to hold stakeholders or agencies accountable for the policy inaction		
External to policy organization (Stakeholder interactions and related issues)	International diffusion or system	Influences from the international organization or country abroad that hindered policy processes	Stakeholder partnership or support	Positive engagement, collaboration, and/or support of relevant stakeholders in the policy process
	Stakeholder relations	Poor relationships, communication, and/or coordination between stakeholders		
Society (Social reactions toward policy)	Lack of awareness or support	Absence of, low social awareness of, or support for the policy, including from the media and community	Social acceptance, awareness or benefit	Social consciousness of, agreement and/or support for the policy, as well as actions relating to public benefits
	Cultural and social beliefs, and local norms	Social disagreements on policy stem from local heritage and ideology.		
	Low demand or other attributes	Poor social demands and acceptance of the		

(continued)

Table3 **Continued**

Theme (Definition)	Barrier subthemes	Definition	Facilitator subthemes	Definition
		policy reforms, or underlying issues linked to the community		
Industry (Industry response and related issues in policy processes)	Risk of public-private partnerships	Underlying concerns of the cooperative relationships between government and food industry that likely jeopardize public health interest and lead to policy inertia	n.a.	n.a.
	Industry resistance or disincentive	Industry opposition arguments, related undermining strategies, and/or unpleasant past experience by the industry that discourages policy adoption	Industry engagement or support	Communications to the industry and/or their support of the policy
Policy specific issues (Constraints of policy nature and its related implications)	Policy characteristics	Weak policy nature, related effects, and constraints identified by stakeholders	n.a.	n.a.
	Nonmandatory	Discrepancies in the policy process that stemmed from being not a compulsory policy, thus there is no stakeholder obligation to policy implementation		
	Technical challenges	Local operational difficulties (mainly at the microlevel) that block the adoption of policy provisions, including institutional conditions and/or the adjoining environments		
Opportunistic advantage (Favorable chances to advance policy progress)	n.a.	n.a.	Policy window	Opportunities arising within local conditions, triggering events and past experience in an area concerning policy processes
			Revenue-related effects	Tangible earnings and intangible benefits for the government or businesses due to policy uptake

Note: n.a. refers to no available barrier or facilitator subtheme identified for the corresponding theme.

as the existence or optimization of available resources linked to former experience and advantages prior to policy adoption, finance, time, evidence, infrastructure, training, human capacity, skills, and interpersonal network. During the policy development stage, most cases relied on scientific evidence, recommendations or guidelines[17,18,41,42,45–47,49,51,55–60,66,69,71–75,80,82,84,85,87,89,93–96]; funding or investment[18,42,46,47,56,68,80,91] through nongovernmental organization grants or donations from philanthropic agencies; in-house infrastructure, and resources[47,50,52,57,64,65,77,81,92]; positive relationships between coalitions[43,47,63,81]; and experience or expertise related to FEPs.[45,64,65,69,71,72,79] Drawing from the Mexican experience, the National Institute of Public Health played a critical role in contributing scientific research to support the soda taxation initiatives.[55]

The *stakeholder partnerships or support* subtheme identifies positive engagement, collaboration, and/or support of relevant stakeholders in the policy process.

Table 4 **Characterization of top cited barriers and facilitators for policy development**

Theme	Subtheme	Overall cases (n = 93)	Policy nature[a]		Country development status	
			Mandatory (n = 74)	Voluntary (n = 7)	Low- to high-HDI (n = 39)	Very-high-HDI (n = 54)
Barriers						
Industry	Industry resistance or disincentive	56	46	4	24	32
Policy commitment	Lack of resources	28	22	2	10	18
Policy governance	Complexity	26	19	2	9	17
Policy commitment	Lack of political will	25	20	3	8	17
Policy commitment	Implementer characteristics	25	20	3	9	16
Policy commitment	Lack of sustainable efforts	n.a.[b]	n.a.	2	n.a.	n.a.
Facilitators						
Policy governance	Strategies in policy process	66	54	5	24	42
Policy commitment	Resource availability or maximization	59	50	4	21	38
External to policy organization	Stakeholder partnership or support	58	49	6	22	36
Opportunistic advantage	Policy window	57	49	5	19	38
Policy commitment	Leadership	40	36	4	14	26
Industry	Industry engagement or support	n.a.	n.a.	4	n.a.	n.a.

[a]For policy nature, total cases do not equal 93. Twelve cases classified as "pending for development" with no specific indication for the policy approach were excluded from the analysis.
[b]n.a. refers to not a top barrier or facilitator subtheme for the corresponding column; thus, no numerical data are provided.

This was the third most cited facilitator majorly implicated in the development of food composition, and trade and investment policies. Cases indicated involvement of various partnerships and support, such as critical collaboration between government agencies[50,56,57,59,60,65,66,69,71,79,82,88,95] and with advocates,[42,46,47,51,55,58,65,68,80–82,84,86,89] industry,[75,82,84] and international organizations.[55,66,67,73,77,79] For example, the early stage of the Brazilian School Nutrition Program involved the participation of several international organizations such as the United Nations Children's Fund and the US Agency for International Development.[77]

The *policy windows* subtheme refers to opportunities arising within local conditions, events that stimulate, and/or past experience in an area concerning policy processes. This fourth facilitator subtheme was frequently associated with supportive political sentiment[18,45,47,54,57,58,65–67,69,71,72,79–82,95,96] and high recognition of country-level obesity and/or diet-related NCDs burden, thereby facilitating FEP development.[44,45,56,57,60,65–67,71–73,80,84,88,93,96,97] For instance, the good political support provided during tenure of the New York City's governing body, coupled with a facilitating role by its food policy coordinator and a Food Policy Task Force contributed to the development of the city's Standards for Meals or Snacks Purchased and Served.[69]

Another well-cited facilitator subtheme was *leadership*, describing leaders with the ambition to promote policy actions. Leadership emerged at individual[17,18,41–43,45,57–59,64,74,79–82,95] and organizational[17,42,47,49,58,63,66,72,73,82,84,85,91,92,94] levels. Leadership could also be expressed in the form of a multitude of support, actions, and/or interactions by health advocates to lead the policy development.[18,41–43,46,47,56,67,71,78,81,82,91,97,98] In the United States, federal leadership and the first lady's interest facilitated the enactment of the Healthy, Hunger-Free Kids Act of 2010.[80]

Mandatory *vs* voluntary policy arrangements- The facilitator subthemes for mandatory policies did not differ from the overall cases. Of note, *industry engagement or support* emerged as a new top facilitator for voluntary policies. This facilitator identifies communications to the industry and/or industry's support of the policy. For instance, in the United Kingdom, food industries were engaged through stakeholder forums to negotiate salt targets in the voluntary salt reduction program.[82]

Country development status- Identical patterns of facilitator subthemes as those for the overall cases were observed. Fewer cases came from low- to high-HDI countries than from very-high-HDI countries, even for the most cited facilitator subthemes such as *strategies in policy process* and *resource availability or maximization*.

Implementation of FEPs

Exploration of barriers. Related to policy implementation, 2 barrier subthemes within the theme of policy-specific issues were well cited in the case analysis (Table 5). This theme identifies constraints of policy nature and its related implications. Other well-cited subthemes were 2 barriers associated with the policy

commitment theme and 1 barrier with the policy governance theme.

Technical challenges was a barrier subtheme associated with the greatest number of cases, particularly when implementing FEP domains related to food provision and food prices. This barrier recognizes local operational difficulties blocking the adoption of policy provisions, which includes institutional conditions and/or the adjoining environment. Microlevel operational difficulties such as staff employment and logistical issues were often cited when implementing FEPs.[99–108] In addition, nonhealth jurisdictions posed frequent challenges to FEP implementation.[53,100,109–121] These included stores selling and promoting unhealthy foods outside schools, the sale of unhealthy foods through vending machines at schools, or noncompliance of vendors to consistently supply healthier food products.[108,111,112,114,117,122–132] In the Philippines, small convenience stores selling unhealthy foods close to schools challenged the implementation of a Department of Education directive for provision of healthy food in schools.[53]

Consistent with policy development, *lack of resources* was the second most cited barrier during policy implementation, with two-thirds of the cases relating to the FEP domains of food provision, promotion, and composition. Lack of funding[32,53,60,90,100,102–112,128,130,132–148]; infrastructure constraints for insufficient kitchen facilities, equipment, space, and/or storage[104,105,107,108,111,114–116,121,122,128,131,134,138,140,149–153]; inadequate human resources[53,93,100,105–108,110,111,115,128,131,132,134,136,139–141,143,145–148,151,152,154–158]; insufficient time for administration[32,78,100,110,113,134,136,137,139,140,142,143,145,149,152,156,158]; and inadequate training[53,104,108,114,127,128,131,133,141,143,149,151,153,156,159–164] were identified as specific resource issues associated with FEP implementation. In Australia, for instance, state government officials reported that insufficient training and resources to monitor health and related claims on food products were barriers to implementation of the Standard on Nutrition, Health and Related Claims (1.2.7).[159]

Implementer characteristics was the third most cited barrier impeding policy implementation. Inadequate knowledge or understanding,[32,69,78,98,105–108,110,113–115,123,129,131,134,135,138,139,154,157,162] business capital–related challenges,[60,90,113,124,127,134,160,161,164,165] and concerns about financial or growth interruption[101,109,113,117,122,124,127,139,152,157,160,161,164,166,167] were commonly cited characteristics. This barrier was frequently encountered when implementing food provision policies, with some cases linked to school background. For instance, in the United States, in schools with students from predominantly low socioeconomic backgrounds, educators concerned about student hunger became less motivated to implement the Food as Reward policy.[168]

Policy characteristics was the fourth most cited barrier, arising from an inherently weak policy nature, related effects, and constraints identified by stakeholders. Studies often reported revenue or cost-related limitations[93,103,110–114,118,119,122–126,137–139,142,153,155–158,164,166,169–171] and lack of robustness[53,72,73,79,112,113,117,121,123,124,127,130,136,161,163,172] of the implemented policies. Food promotion, labelling, and provision were FEP domains mostly cited in cases for this barrier. For instance, some recreational facility managers in Canada refused to implement the Alberta Nutrition Guidelines for Children and Youth because they considered the guideline too lengthy.[113]

Complexity emerged as another frequently cited barrier, with case proportion observed to be higher in food retail and promotion domains. Many studies reported regulatory conflicts, authority purview limitations, or bureaucracy burdens that hindered policy implementation.[32,53,60,68,69,90,103,110,124,125,133,137,139,149,150,161,167,173,174] Similar to policy development, complexity during policy implementation also was linked to competing interests[53,78,101,107,108,112,118,130,132,137,152,161,169,172] such as the use of unhealthy foods for revenue or fundraising to benefit teachers' cooperatives.

Mandatory *vs* voluntary policy arrangement- When implementing mandatory policies, most barriers were typically consistent with the overall cases. The only exception was *lack of awareness or support*, which ranked as the fifth most cited barrier for mandatory policies. This barrier subtheme signifies the absence of low social awareness or support for the policy, including from the media and community. For instance, public pushback in the Cook County, Illinois, in the United States occurred in response to tax fatigue and the lack of media support, resulting in the repeal of an implemented local government SSB tax in December 2017.[68] For voluntary policies, a similar pattern of barrier subthemes occurred with the overall cases. An exception was the *low demand or other attributes* subtheme, which emerged as the fifth most cited barrier for voluntary polices. This barrier characterizes poor social demands and acceptance of the policy reforms, or underlying issues linked to the community. In Ireland, a lack of consumer nutrition knowledge hindered the implementation of a calorie menu-labelling scheme.[164] Notably, these 2 emerging barrier subthemes for both mandatory and voluntary FEPs, respectively, emerged from the society theme, designating social reactions toward policy.

Country development status- The top 3 barriers identified for overall cases also recurred for low- to high-HDI countries. The remaining top barriers related to *industry resistance or disincentive* and *lack of monitoring*, with equal cases identified for both barriers. The latter barrier denotes the absence of or limited routine monitoring to determine policy effectiveness and

Table 5 **Characteristics of top cited barriers and facilitators for policy implementation**

Theme	Subtheme	Overall cases (n = 130)	Policy nature[a]		Country development status	
			Mandatory (n = 98)	Voluntary (n = 30)	Low- to high-HDI (n = 41)	Very-high-HDI (n = 89)
Barriers						
Policy specific issue	Technical challenges	76	53	21	19	57
Policy commitment	Lack of resources	73	52	20	24	49
Policy commitment	Implementer characteristics	72	47	23	13	59
Policy specific issue	Policy characteristics	59	45	n.a.[b]	n.a.	49
Policy governance	Complexity	44	n.a.	15	n.a.	34
Society	Lack of awareness or support	n.a.	29	n.a.	n.a.	n.a.
Society	Low demand or other attributes	n.a.	n.a.	13	n.a.	34
Industry	Industry resistance or disincentive	n.a.	n.a.	n.a.	12	n.a.
Policy governance	Lack of monitoring	n.a.	n.a.	n.a.	12	n.a.
Facilitators						
Policy governance	Strategies in policy process	89	66	21	22	67
Policy commitment	Resource availability or maximization	68	49	19	20	48
External to policy organization	Stakeholder partnership or support	49	36	12	15	34
Society	Social acceptance, awareness or benefit	37	26	10	n.a.	34
Policy commitment	Positive perceptions or attitudes	34	24	9	n.a.	31
Industry	Industry engagement or support	n.a.	n.a.	9	9	n.a.
Opportunistic advantage	Revenue-related effects	n.a.	n.a.	9	n.a.	n.a.
Policy governance	Monitoring and accountability system	n.a.	n.a.	n.a.	9	n.a.

[a]For policy nature, total cases do not equal 130. Two cases were excluded for policy nature characteristics, with reasons either due to insufficient information or non-distinguishable barriers and facilitators.
[b]n.a. refers to not a top barrier or facilitator subtheme for the corresponding column; thus, no numerical data are provided.

compliance. For instance, monitoring was lacking when implementing the Healthy Snacking Initiative in Uruguay, particularly for food sold by parents or students for fundraising purposes.[121] In comparison with the overall cases, a new barrier, *low demand or other attributes*, was identified for the very-high-HDI countries, which mainly related to poor social acceptance of policy changes.

Exploration of facilitators. Among cases reviewed under policy implementation (Table 5), the policy commitment theme was frequently cited among subthemes ($n = 2$ of 5). Other facilitator themes were policy governance, external to policy organization, and society. In general, at least half of cases for the most cited facilitator subthemes concerned the implementation of food-provision policies.

Strategies in policy process was identified as the most cited facilitator. Case proportion in the context of implementing FEPs was higher in food provision, composition, retail, prices, and labelling domains. The cases highlighted facilitating approaches as creative or innovative,[69,72,101–103,106,108,112,117,118,120,121,123,126,131,144–148,152,156,164,165,169,172,173] such as menu planning, incorporating standards into contracts, reward or rebate schemes, optimizing agriculture lands to self-sustain fresh produce, and organizing cooking demonstrations. For instance, some cafeterias adopted fast-food restaurant layouts with colorful booths and banners, when implementing the Texas Public School Nutrition Policy.[172] Other approaches included leverage costing or monetary-related strategies[77,90,105,106,117,118,123,126] and providing support and/or coordination,[69,97,99,104,162,164,167,175] such as an appointment of a health promotion manager.

The second most cited facilitator was *resource availability or maximization*, with a higher case proportion exploring food provision and retail policies. Training[53,69,72,78,90,99–102,104,105,107,109,114,123,131,134,143,145–148,151,153,156,160,162,164,170,175,176] and funding or financial support,[32,65,77,98,102–104,106,107,109,111,122,123,129,143,146–148,150,152,153,160,161,164,174] such as government grants and subsidies to compensate loss and infrastructure support,[78,90,111,113,114,116,149,160,167,176] were identified as critical for facilitating FEP implementation. In addition, experience and expertise of stakeholders benefitted policy implementation.[98,103,104,113,120,121,139,161,174,176] For example, the implementation of the Western Australian Healthy Food and Drink Policy was facilitated by training and assistance provided to the canteen managers, although those with prior experience related to a voluntary food categorization system readily adopted the policy.[176]

Stakeholder partnership or support was the third most cited facilitator when implementing FEPs. Even though the identified policy stakeholders for policy implementation were similar to those described for policy development, specific stakeholders were identified,[32,101,102,106,109,111,123,129,144,176,177] such as

teachers, parents, operating staff, parent and children committees, community partners, school principals, and/or public health dietitians. Stakeholders perceived as critical to support policy implementation included government departments, agencies, or officials[32,103,137,178]; professionals or academia[119]; and school administration.[104,145,149] For example, the National Education Development Fund partnered with the Federal Institutions of Higher Education to establish teaching and research centers involving 8 universities to facilitate implementation of the Brazilian School Nutrition Program.[77]

Social acceptance, awareness, or benefit was the fourth most cited facilitator. This facilitator aligns with social consciousness, agreement on and/or support of the policy, as well as actions relating to public benefits. This could be expressed through good community cooperation[80,85,111,120,123,129,149,169,170,172] and community understanding of health benefits or goals[65,102,114,134,170] for implementing FEPs. Alternatively, this subtheme may be reflected by social adjustment to changes[95,100,124,144,172] and increased demand for healthy food products,[101,114,134,167] as shown by repeated food purchases after policy adoption.[179]

Positive perceptions or attitudes relates to favorable values, beliefs, and views of stakeholders or implementers to move policy actions forward. This was the fifth most cited facilitator. Attitudes of willingness to try, change, or adapt[97,101,103,113,114,118,122,123,145,152,172,175] and perceptions aligned with healthy eating,[112,113,118,120,134,137,145,161] positive social impacts, and/or responsibility values[32,102,112,122,127,130,165,169] were examples cited as facilitators when implementing FEPs. For instance, canteen managers in South Australia with healthy-eating mindsets were more likely to make changes and enable food catering services to be aligned with the Eat Well South Australia Schools and Preschools Healthy Eating Guidelines.[145]

Mandatory *vs* voluntary policy arrangement- Facilitators for voluntary and mandatory policies were almost identical to those for overall cases. Specific to voluntary policies, *industry engagement or support* and *revenue-related effects* emerged as new facilitators. *Revenue related effects* refers to tangible earnings and intangible benefits (eg, stay competitive in the market) for government or businesses due to policy uptake. For example, some non-children favorite food businesses (eg, family restaurants, food courts in department stores or large supermarkets) in South Korea voluntarily adhered to the government's nutrition labelling requirements for children's favorite food businesses (ie, those with at least 100 stores that make and sell hamburgers, pizza, baked goods, and ice-cream), to protect their brand image and differentiate themselves from competitors.[157]

Country development status- An identical pattern of facilitators was observed between very-high-HDI countries and overall cases. In contrast, *industry engagement or support* and *monitoring and accountability system* were new facilitators identified for low- to high-HDI countries. The *monitoring and accountability system* subtheme describes a system to evaluate policy progress and impacts and hold stakeholders or agencies to account for policy inaction. In China, the Ministry of Education conducted regular monitoring with whistleblower and accountability systems in place when implementing the Nutrition Improvement Program for Rural Compulsory Education Students.[146–148]

Overall, the proportion of identified cases was lower for low- to high-HDI countries compared with very-high-HDI countries even for the most cited facilitator subthemes, particularly the subthemes of *resource availability or maximization* and *strategies in policy process*.

DISCUSSION

Literature reporting on barriers and facilitators related to FEP processes has increased vastly since 2009. This trend probably reflects the interest of public health stakeholders toward the WHO recommendations for improving food environments.[9–10] In the present systematic review, we synthesized barriers and facilitators that have influenced the development and implementation processes of FEPs. Related themes recurred but subthemes differed by policy processes. These barriers and facilitators for FEP processes often were antithetical (eg, *lack of resources vs resources availability or maximization*), but there were nuanced subthemes according to the policy processes and also according to the policy nature and country development status.

There were some variations between the most frequently cited barriers and facilitators to policy processes in the current review, in comparison with earlier reviews on a similar topic.[25–27] In the present review, we observed relatively fewer cases in which *stakeholder relations*, which refers to poor relationships, communication, and/or coordination between stakeholders, was cited as a barrier to policy progress. In contrast, Cullerton et al.[25] identified government silos as a major barrier to progress on nutrition policy change. On the other hand, we identified *strategies in policy process* as the most cited facilitator to implement food provision and labelling policies, which received less attention previously.[26–27]

In terms of country development status, fewer cases were evident for low- to high-HDI countries (which also fulfilled the characteristics of being LMICs in this study), compared with very-high-HDI countries.

Turner et al[15] also concurred there was scarce research on FEPs in LMICs. However, subthemes unique to the low- to high-HDI countries were detected in the present review. For example, barriers related to *lack of monitoring* and *industry resistance or disincentivize* were observed. Whereas facilitators linked to *industry engagement or support* and *monitoring and accountability system* were subthemes typical to implementing FEPs in low- to high-HDI countries. Variations for these barriers and facilitators across country development status that were identified in this review will be relevant to health reform stakeholders when designing FEPs in LMICs. For instance, international agencies such as WHO could optimize facilitators and mitigate the cited barriers in LMICs when formulating country-specific strategies to promote FEPs development and implementation. For example, the *lack of monitoring* barrier could hinder the implementation of the monitoring framework for restricting unhealthy food marketing to children in LMICs, resulting in stakeholders not being held accountable for commitments.

Social indifference in policy implementation is influential in progressing policy, but we found this depended on the country development status. The society theme was prevalent in very-high-HDI countries, but not for low-to high-HDI countries. Specific to very-high-HDI countries, low demand from society to bring positive change to FEPs, along with consumer ignorance about policy implementation, were social barriers. These conditions were typical to implementing food provision polices,[101,109–112,117,118,123–126,138,161,162,170,172,175,180] followed by food pricing[116,119,133,167] and labelling[157,160,177] policies. Such sentiments were not usual for low- to high-HDI countries. Further exploration of the sociocultural factors related to societal actions[6] is warranted to guide appropriate strategies and enable smooth policy implementation, particularly in low- to high-HDI countries.

Literature to date has focused on policy commitment and governance themes underpinned by core values of resources, administration, leadership, characteristics, and resolution. These values were also specific to the policy processes identified in this review, forming either barriers (if insufficient) or facilitators (if adequate). It also appeared that policy framing required incorporating these core values to catalyze policy development. For example, neoliberal market framing influenced policy agenda-setting governing trade by the Trans Pacific Partnership agreement governing trade.[181] This view on trade globalization likely prevails for other FEPs and would affect public health advocacy due to resource and power limitations during policy discussion. Contrarily, nonhealth considerations in FEP framing, such as protecting local economies or channeling revenue from unhealthy food taxes to benefit communities, have gradually gained importance in recent years through engagement with non-traditional health-reform stakeholders such as nonhealth ministries and organizations.[45,55,64,80,87,89]

This review reveals food-industry involvement during the FEP processes acts as a double-edged sword. It appeared that the industry theme was the biggest impediment to the development of policy,[41–49,52–67,78] irrespective of the nature of policy or country development status. Paradoxically, the industry theme also facilitated the implementation of FEPs[113,175,177,182] concerning voluntary policies and those from low- to high-HDI countries. For example, early industry engagement in voluntary policies involving salt-reduction initiatives[46,82] occurred in the United Kingdom and South Africa. Similar interest was applied to the Health Star Rating[63] to inform food choices or self-regulatory codes[62] to reduce food marketing to children in Australia. Such engagement was perceived as no other option, due to significant industry power,[63] which inevitably carries impacts from conflicts of interest in the long term.[6] For instance, delays in full policy implementation and undermining of public health efforts through public-private partnerships were experienced in the Health Star Rating implementation.[6] This highlights the need for stronger government roles in FEP processes and accountability systems applied to the industry in creating healthy food environments.

Information and messaging strategies used by the industry were frequently identified as barriers to policy progress, which aligns with other evidence on corporate political activities.[183] For the *industry resistance or disincentive* subtheme, cited strategies included lobbying of policy makers,[17,42,45,49,52–61] warning of potential unemployment,[17,49] promoting industry deregulation,[55] and shaping the debate on diet- and public health–related issues.[41–45,67,68] The magnitude of opposition from industry to policy development may be measured through legal challenges[43,64,65] or lobbying for counter legislation or competing bills,[43,91] as evidenced in the United States when framing menu-labelling policy. Given commercial influence in undermining public health goals,[6,16] policy makers should re-examine the nature of industry engagement during policy development. Perhaps industry engagement, in the form of forums or roundtables,[82,84] rather than involvement in the policy decision-making process, is the way forward to overcome commercial interests and manage underlying conflicts of interest.

Central to facilitating FEP processes is the requirement for cross-government agencies and/or multistakeholders, as reflected in the external to policy organization theme. For instance, intragovernmental

agency collaborations between the Ministries of Health and Finance of the Philippines[59], Estonia,[66] and Fiji[88] were cited as facilitators enabling the enactment of an SSB tax. In addition, country collaborations with the WHO regional offices facilitated the introduction of an SSB tax in Estonia,[66] mutton-flap import quota in Tonga,[79] and actions to control unhealthy food marketing to children and adolescents in Mexico.[55] Such collaborations might provide important supportive policy influences, particularly for LMICs with expertise limitations. Opportunistic advantage, a facilitator-specific theme that mainly contributed by favorable political conditions,[18,45,47,54,57,58,65–67,69,71,72,79–82,95,96] or even the public health burden of a country,[44,45,56,57,60,65–67,71–73,80,84,88,93,96,97] might also create windows of opportunity for policy enactment.

Barriers critical to policy implementation were identified through the theme on policy specific issues. *Technical challenges* picked up nonhealth jurisdiction barriers limiting the scope of the implemented FEPs, as in the case of unhealthy food environments existing outside the school boundary.[111,112,117,121,127–131] Going beyond health jurisdictions may offset these challenges, as observed with the proposal of a comprehensive and integrated policy package established through the Health in All Policies framework.[54] We identified only 7 studies, all published after 2013,[41,44,45,51,54,73,99] in which authors explored comprehensive approaches to policy making. Considering the example of Chile, a policy package combined different food-environment domains within the Law of Food Labelling and Advertising.[51,73] Such a policy arrangement may consolidate resources and achieve better policy outcomes. Goal setting for a comprehensive approach to FEP development, in tandem with the Sustainable Development Goals set by the United Nations,[184] could be a future consideration. Because these are broad goals, health-reform stakeholders should be mindful of competing non-food environment agendas.

The prevailing literature on FEPs mainly focused on the food provision domain, in contrast to lesser coverage given to the food retail, promotion, and trade and investment domains. Furthermore, voluntary policies were scarcely reported, relative to the mandatory policies, irrespective of policy development or implementation. More examination of government-led FEPs targeting public sector workplaces, as well as FEPs at the subnational levels, will be required. These sparsely studied FEP areas reveal research gaps and warrant intensifying resources and research priorities. Moreover, some subthemes that were only identified in articles published in the last decade were scarcely considered in earlier studies. For example, since 2013, the *monitoring and accountability system* was repeatedly emphasized as an important facilitator in the government-led FEP processes.[42,69,73,75,97,98,101,105–107,139,146–148,160,164] The growing interest pertaining to this subtheme should be considered in assessing FEP progress in the future.

Some limitations in this systematic review are acknowledged. Because the responsibility for many FEPs lies outside the remit of government health portfolios, some information on policy development and/or implementation would be omitted if reported without accompanying health terms in the article title, abstract, or keywords (eg, obesity). Despite this limitation, a sufficiently large number of records ($n = 17{,}638$ without duplicates), eligible studies ($n = 142$), and cases ($n = 193$) were retrieved, allowing the synthesis of a narrative understanding of the barriers to and facilitators of FEP processes. Importantly, based on this large literature retrieval volume, a coherent pattern was observed when investigating different characteristics (ie, policy nature and country development status), which strengthened the review findings. To our knowledge, this is the first systematic review in which barriers and facilitators of government-led FEPs were investigated along with the appraisal of relevant eligible studies that categorized the major proportion as either fair or high quality research. Besides the inclusion of FEPs guided by Food-EPI domains,[14] insider perspective and non-English publications, barriers and facilitators specific to policy development and implementation, as well as investigation of characteristics were strengths of this study. There were no substantive differences in themes or subthemes identified from the non-English literature, so all eligible studies were considered collectively in this review. Overall, the inclusion of non-English literature filled the gap of countries with fewer English publications and strengthened generalization of findings to different country contexts.

This systematic review raises some key questions (Table 6) that should be addressed by health-reform stakeholders to ensure robust development and implementation of FEPs. Policy development and implementation evolve from careful consideration, planning, and review. These elements are critical to building effective FEPs and public health strategies to address obesity and diet-related NCDs. The immediate outcome of this review is the collation of the experiences of various countries and critical elements that are integral to the policy processes of FEPs, which will support health-reform stakeholders in policy development and integration.

CONCLUSIONS

In this review, we summarize key elements in global literature citing barriers and facilitators that prevent, constrict, or accelerate the policy process of FEPs. Health-

Table 6 **Critical key questions to health-reform stakeholders**

Key questions for consideration:
1. The policy environment: what is it, who is involved, and is it supportive? What strategies can be used to facilitate the policy (eg, policy framing, negotiating with stakeholders, media usage, monetary support)?
2. Who are the potential or existing partners to engage in the policy process? How can they contribute as health advocates?
3. Are sufficient resources allocated or available? How can resources be maximized? How can barriers to resource allocations be overcome?
4. What are the key elements of industry resistance (or support)? How can these be overcome (or enhanced)?
5. Are there technical challenges to implementation? How can they be addressed or mitigated?
6. [Specific to low- to high-HDI countries or LMICs] How is monitoring conducted for policy implementation? What are the accountability mechanisms? What can strengthen the accountability mechanisms?

Abbreviations: HDI, Human Development Index; LMIC, low- and middle-income country.

reform stakeholders engaged in policy processes need to understand complex policy cycles, recognize common barriers (eg, *industry resistance or disincentive* and *lack of resources*), and/or facilitators (eg, *strategies in policy process* and *stakeholder partnerships or support*) of policy development and implementation and acknowledge how to facilitate FEPs in their countries. Such reflections will assist in building a robust mechanism to achieve policy goals and objectives, creating healthy food environments.

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Supporting Information

The following Supporting Information is available through the online version of this article at the publisher's website.

Table S1 Example of level search strategy on Web of Science database

Table S2 List of government websites screened using Google Advanced Search

Table S3 Characteristics of 142 eligible studies

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