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THE EFFECTIVENESS OF POLICIES AND PROGRAMMES PROMOTING FRUITS AND VEGETABLES

Background paper for the FAO/WHO international workshop on fruits and vegetables 2020



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by Sarah Gerritsen, Simón Barquera and Luke Wolfenden

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The authors declare that they have no conflicts of interest.





1.

INTRODUCTION

IMPROVING FRUIT AND VEGETABLE CONSUMPTION CAN DECREASE ILLNESS AND PREMATURE MORTALITY

Inadequate fruit and vegetable intake is a substantial contributor to the international burden of disease (Afshin *et al.*, 2019; Lim *et al.*, 2012). Low fruit and vegetable intake is ranked among the leading dietary risk factors for mortality across low, middle, and high-income countries throughout all WHO regions, with almost 4 million deaths worldwide in 2017 attributable to inadequate intake (Afshin *et al.*, 2019). The high content of micronutrients, antioxidants, phytochemical compounds, and fibre in fruits and vegetables has been suggested as the mechanism by which their intake reduces the risk of a range of chronic diseases, particularly cardiovascular disease and stroke (Aune *et al.*, 2017; S. Liu *et al.*, 2000; He, Nowson and MacGregor, 2006), and certain cancers, such as those of the digestive system (Vainio and Weiderpass, 2006; Riboli and Norat, 2003). Fruit and vegetable intake may also have a number of other benefits, with evidence of an association between fruit and vegetable consumption and improved mental health, particularly lower rates of depression (Liu *et al.*, 2016; Głąbska *et al.*, 2020), increased immunity (Hosseini *et al.*, 2018), and slower cognitive decline (Loef and Walach, 2012).

Additionally, the work of the Lancet-EAT Commission demonstrates that both human and planetary health is dependent on the world's population transforming their diet so that it consists of a variety of plant-based foods (Willett *et al.*, 2019). This will necessitate a shift in food systems to enable the global population to shift their diet toward greater intake of fruits and vegetables (Willett *et al.*, 2019).

DAILY FRUIT AND VEGETABLE INTAKE IS LOWER THAN RECOMMENDED

The World Health Organization recommends at least 400 grams of fruit and vegetables should be consumed per adult per day (World Health Organization, 2019b) to promote good health and reduce the risk of a variety of chronic diseases (Yip, Chan and Fielding, 2019; Boeing *et al.*, 2012). However, international surveys suggest that consumption levels fall well below recommended levels. An analysis of 266 country-specific nutrition surveys in 2010 found global fruit intake averaged just 81 g per day, ranging from 19 g to 325 g/adult/day, with the lowest fruit intakes found in South and Central Asia and East and Southern Africa (Micha *et al.*, 2015). Vegetable intake also varied by country, ranging from 35 g to 493 g/adult/day, with a global mean of 209 g/adult/day. The lowest average vegetable intakes were in Southern Africa, Latin

America, Central Asia, and Oceania, and the majority of countries had mean intakes below the recommended amount for both fruits and vegetables (Micha *et al.*, 2015). Similarly, estimates in children and youth from the Global School-Based Student Health Survey suggest that less than a third of adolescents from low- and middle-income countries meet or exceed the minimum WHO recommended levels of fruit and vegetable intake (Darfour-Oduro *et al.*, 2018). Universally, individuals with low household income or of a low socioeconomic position are less likely to eat sufficient fruit and vegetable servings per day (Giskes *et al.*, 2010; Kamphuis *et al.*, 2006).

THE DETERMINANTS OF FRUIT AND VEGETABLE CONSUMPTION ARE MULTIFACTORIAL AND INCLUDE INDIVIDUAL, SOCIAL, POLITICAL, ECONOMIC, AND ENVIRONMENTAL FACTORS

Food decisions are complex. As a result, the reasons why people do not eat enough fruits and vegetables are complex. Figure 1 depicts a range of determinants that interact and operate at different levels to influence fruit and vegetable intake. Beginning at the centre layer (purple in Figure 1) are the individual sociodemographic characteristics and early life experiences. Eating a variety of fruits and vegetables in childhood sets healthy habits across the life course (Birch and Doub,



2014). Children can learn to like the taste of foods if introduced early, with tastes transferred to babies even in utero and through breast milk (Nehring *et al.*, 2015). Repeated exposure to fruits and vegetables from an early age through childhood helps with flavour acceptance and liking of vegetables (Caton *et al.*, 2013; Spill *et al.*, 2019). Role modelling by adults and peers who eat and enjoy fruits and vegetables can also influence a child's taste for these foods (Wyse, Wolfenden and Bisquera, 2015; DeCosta *et al.*, 2017), and dietary habits established in early childhood can transfer through the life course (Appleton *et al.*, 2016; Guillaumie, Godin and Vézina-Im, 2010). In adulthood, these habits – plus cost and time, particularly for low-income-earners – become the main barriers to fruit and vegetable consumption (Livingstone *et al.*, 2020). Cultural and

social norms (light blue in Figure 1) can both boost and detract from consumption of fruits and vegetables, with the social meaning of foods sometimes lost or changed by colonization and globalization (Sarkar, Walker-Swaney and Shetty, 2019; Raschke and Cheema, 2008; Weerasekara *et al.*, 2018; Harris *et al.*, 2019).

At the community level (green in Figure 1), the easy availability of fruit and vegetables and healthy local food environments improve consumption (Kamphuis *et al.*, 2006; Livingstone *et al.*, 2020). Conversely, accessibility and marketing of foods that do not contain fruits and vegetables lowers intake (Afshin *et al.*, 2014; Gerritsen and Renker-Darby *et al.*, 2019). What is available in the community environment is governed by what is produced, marketed, and regulated (yellow in Figure 1), and

FIGURE 1: Socioecological model of the barriers and opportunities for fruit and vegetable consumption



Source: Adapted from Afshin *et al.*, 2014.



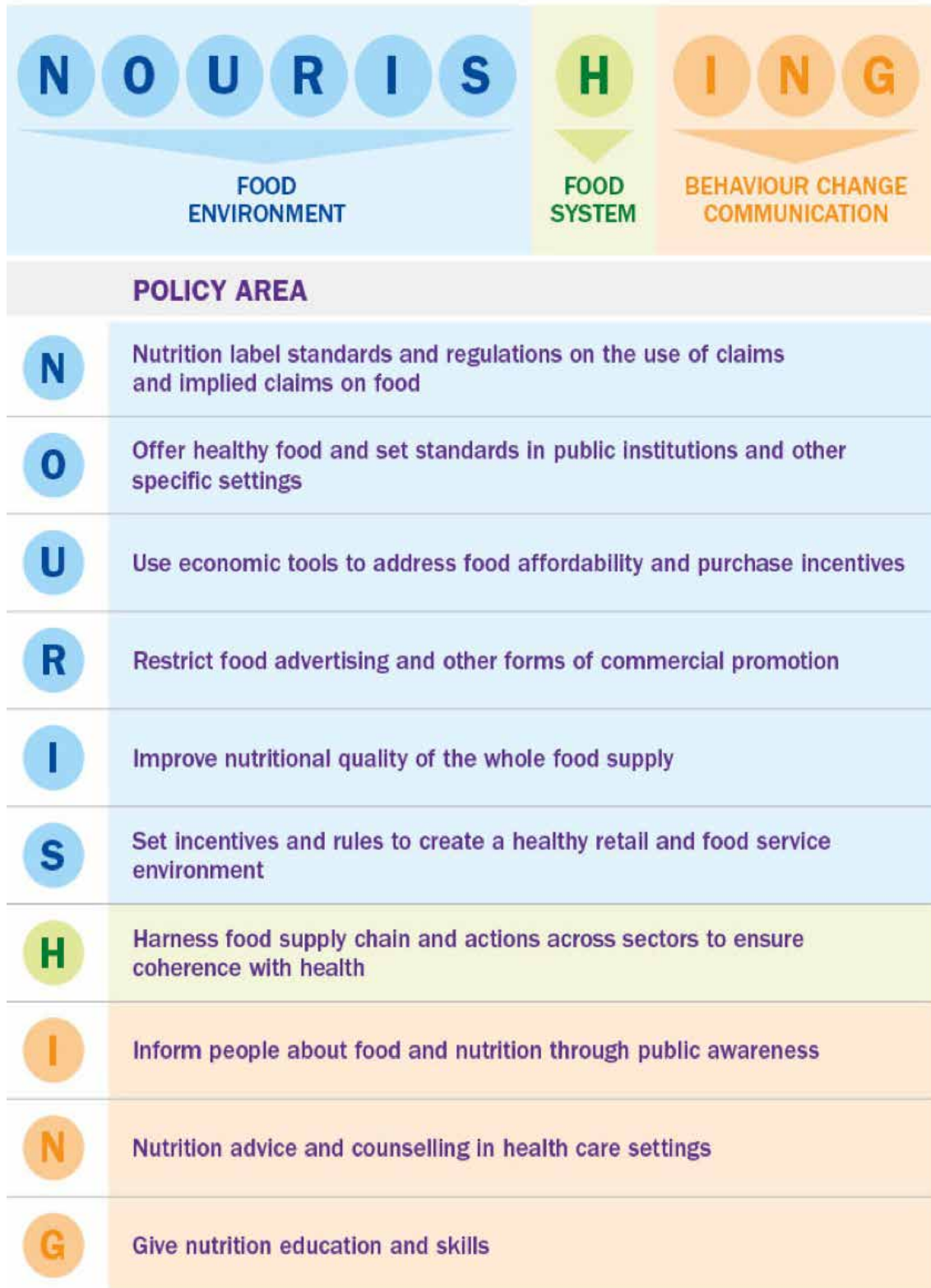
availability is in turn influenced by governmental decisions at the national (orange in Figure 1) and global (red in Figure 1) levels. Dietary guidelines and education, fiscal incentives and disincentives, food assistance programmes, procurement nutrition standards and food industry standards, food marketing and zoning restrictions, support for research, and coordination across government departments all play a role in promoting a healthy population diet (Gerritsen and Harré *et al.*, 2019; Mozaffarian *et al.*, 2018).

THE AIMS OF THIS REPORT

This report was written to provide an overview of the global evidence on the effectiveness of policies, laws, regulations, and programmes from governments, civil societies, NGOs, the private sector, and international organizations that promote fruit and vegetable consumption. The report is a background paper for the Food and Agriculture Organization of the United Nations and the World Health Organization's International Workshops on Fruits and Vegetables, held virtually during August and September 2020.

Chapter 2 summarizes an umbrella review of the systematic literature review to condense what is known about the most effective ways to improve fruit and vegetable consumption. The findings from the literature are then mapped onto the NOURISHING Policy Framework (Figure 2) to assist with understanding the key policy domains where effective action could occur.

FIGURE 2: World Cancer Research Fund NOURISHING Policy Framework



Source: Hawkes, Jewell and Allen, 2013.

Chapter 3 describes an inventory of current fruit and vegetable policies and programmes globally. These too are mapped against the NOURISHING Policy Framework to characterize the areas in which action to improve fruit and vegetable intake is occurring.

Chapter 4 presents case studies of some of the interventions contained in the inventory. Policy or programme coordinators were asked to write a brief summary of their interventions and discuss the impact of and lessons from their work.

Chapter 5 draws on the work presented in earlier chapters to explore gaps in the research evidence (e.g., where more research is required) and gaps in implementation of what is known to work to improve fruit and vegetable consumption. Recommendations are provided to guide policymakers and community leaders wishing to improve the health of their populations through increased fruit and vegetable consumption.





2.

**EVIDENCE OF
EFFECTIVENESS
OF PROGRAMMES
AND POLICIES**

INTRODUCTION

Given the burden of disease attributable to insufficient intake of fruit and vegetables, the implementation of policies and programmes of practices (hereafter referred to as “interventions”) is recommended as part of any global strategy to prevent non-communicable disease (World Health Organization, 2019a). The complex and multi-level nature of the determinants of fruit and vegetable intake provide a range of factors that could be targeted to improve consumption, all of which should be assessed to determine the potential impact of different interventions, including the potential population reach, cost, community acceptability, and impacts on equity (Milat *et al.*, 2016). The requisite characteristic of any intervention designed to impact fruit and vegetable intake, however, is for it to be effective. An appraisal of the scientific evidence regarding the effectiveness of interventions is therefore recommended to inform investments in public health policy and practice decision-making to improve public health nutrition.

Systematic reviews collate and synthesize all of the available empirical evidence to answer a specific research question using explicit, systematic and reproducible methods (Higgins *et al.*, 2019). In doing so, they seek to provide a comprehensive and unbiased assessment of the effects of an intervention. “Umbrella” reviews are collations of findings of all relevant systematic reviews on a topic. They are par-

ticularly useful in consolidating a broad evidence-base, enabling comparison of the effects of different intervention options, and identifying gaps where policy or practice is occurring in the absence of (or contrary to) evidence, or where beneficial interventions are not being routinely delivered (Aromataris *et al.*, 2015). To support public sector organizations to identify and develop interventions to improve population-level intake, we undertook a systematic umbrella review to describe the effectiveness of a wide array of interventions, relative to control settings or alternate interventions, in improving fruit and vegetable intake among children and/or adults.

METHOD FOR THE UMBRELLA REVIEW

A comprehensive description of the review methods and findings have been published elsewhere (Wolfenden *et al.*, 2021). The review was guided by recommendations for the conduct of umbrella reviews by the Joanna Briggs Institute (Aromataris *et al.*, 2015), and the Cochrane Handbook’s guidance for the conduct of systematic overviews of reviews (Higgins *et al.*, 2019). The review protocol was deposited in a publicly available Open Science framework prior to execution of the search strategy (Wolfenden *et al.*, 2020).

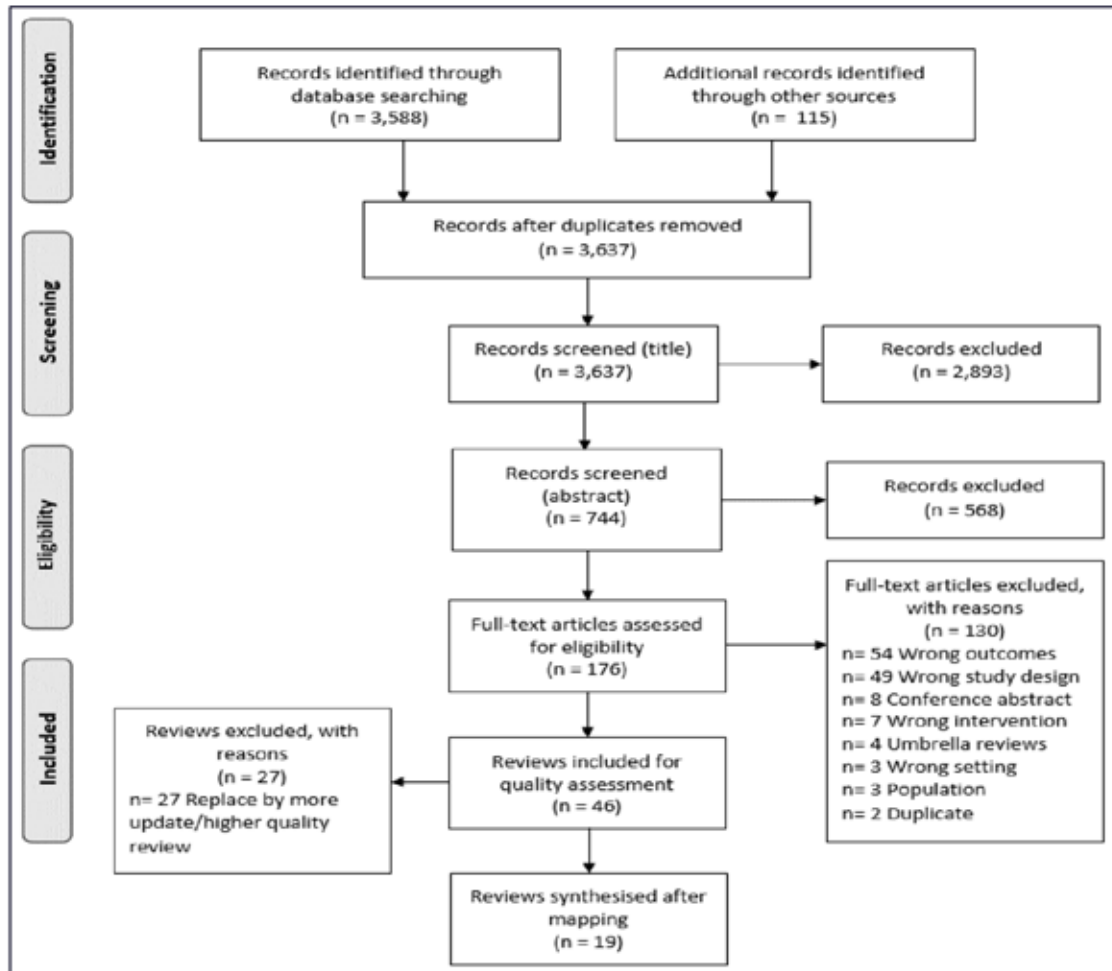
Review inclusion criteria: We included systematic reviews with or without meta-analysis that assessed the effectiveness of any intervention on a measure of fruit or vegetable intake in any population group. Reviews must have evaluated the effects of interventions using any prospective design, with or without comparison or control group (e.g. randomized trial, non-randomized trial, pre-post, prospective observational study). We did not apply any language-related eligibility criteria. Reviews published before 2011, reviews of interventions on population groups selected on the basis of pre-existing co-morbidities (e.g. those with type 2 diabetes), interventions that targeted the treatment or management of eating disorders or other diseases, or reviews of interventions undertaken in laboratories or other simulated contexts (such as lab-based experiments of infant feeding practices) were excluded.

A systematic search of multiple electronic databases (MEDLINE, Embase, CINAHL, The Cochrane Library, Scopus, and Academic Search Ultimate, Google Scholar) for peer reviewed and grey literature was executed by an information specialist on 9 June 2020. Additionally, searches were conducted for publications in the WHO e-Library of Evidence for Nutrition Actions (eLENA), and the World Cancer Research Fund NOURISHING website. We also performed targeted searches for grey literature on Google and contacted experts from WHO and FAO to identify any additional potentially eligible reviews. A single reviewer initially screened all citations and

excluded all clearly ineligible studies. Data screening and extraction were then performed independently and in duplicate.

Re-analysis of primary studies was not undertaken. If two or more reviews report the effects of the same type of intervention, we included only that reported in the most recent high-quality review. The methodological quality of included reviews was assessed independently and in duplicate using the 12-criteria critical appraisal tool developed by the Joanna Briggs Institute. We used previously published thresholds for determining overall review quality, in which reviews meeting less than 33 percent of the criteria were rated as low quality, 34–66 percent as medium quality, and 67 percent or more as high quality.

FIGURE 3: Search strategy and results for the umbrella review of systematic reviews that assessed the effectiveness of interventions on fruit or vegetable intake.



Source: Adapted from Moher et al., 2009.

RESULTS OF THE UMBRELLA REVIEW

Figure 3 describes the yield of the review search and the result for the review screening process. Of the 3 637 citations screened, ultimately, the findings of 19 systematic reviews were included and reported in this umbrella review (Afshin *et al.*, 2015; 2017; Carter *et al.*, 2018; Champion *et al.*, 2019; Cornelsen *et al.*, 2015; DeCosta *et al.*, 2017; Feltner *et al.*, 2016; Girard *et al.*, 2012; Hendren and Logomarsino, 2017; Hendrie *et al.*, 2017; Hodder *et al.*, 2020; Hollis-Hansen *et al.*, 2019; Hsiao, Sibeko and Troy, 2019; Langford *et al.*, 2014; Micha *et al.*, 2018; Patnode *et al.*, 2017; Rochira *et al.*, 2020; Rodriguez, Rocha and Kim, 2019; Silveira *et al.*, 2011). A full description of included reviews is provided elsewhere (Wolfenden *et al.*, 2021). Briefly, two of the 19 reviews included studies from the United States and one review from low- and middle-income countries only, while four included only randomized controlled trials. Eight reviews included studies undertaken in children and youth only, two were in adults (>18 years) only and nine were not restricted by age (one did not specify). Reviews included a range of interventions across community and clinical settings, and addressed multiple determinants of fruit and vegetable intake. Seven reviews included meta-analyses describing the effects of interventions. Twelve reviews were rated as high quality, six as medium quality and one as low quality (Table 1).

When mapped against the NOURISHING framework, the interventions synthesized in the included reviews represented a fraction of those recommended by the framework to improve public health nutrition. Specifically, the interventions assessed among the included reviews were mapped to eight of the ten NOURISHING policy areas but covered just 14 of the 65 sub-policy areas (see Table 3). Mapping the reviews against the criteria, however, was complicated, as a number of the interventions included components that may address different sub-policy areas. Further details describing the mapping process and the specific interventions and reviews mapped to each policy (sub-policy) area are provided elsewhere (Wolfenden *et al.*, 2021).

Nonetheless, most of the interventions assessed had a positive impact on fruit and vegetable intake. Broadly, there was evidence to support the effectiveness of interventions undertaken in a range of settings targeting intake for children (such as the home, childcare, and school) and adults (e.g. workplaces and primary care), including eHealth interventions and mass media campaigns. Interventions that focused on supporting household food production, such as gardens, were also found to improve measures of fruit and vegetable intake. Fiscal interventions that impact the relative price of fruits and vegetables influence intake. Subsidies increase the intake of fruits and vegetables, as do price increases on some other food products, such as sweets. Increasing the price of fruit and vegetables, howev-

er, reduces their consumption. Evidence remains uncertain regarding the effects of choice architecture and individual and group community-based programmes, and while the introduction of some new retail opportunities such as mobile produce markets may improve intake, there is some evidence to suggest that the introduction of supermarkets may have an adverse effect on intake. A more detailed summary of the effects of interventions as characterized by the included reviews is provided in Appendix B.

TABLE 1: The effects of fruit and vegetable interventions reported in included reviews

INTERVENTION	REVIEW QUALITY*	EFFECT
School-based interventions		
Providing (free or at reduced cost) or increasing the availability (e.g. in cafeterias) of F&V	High	√
Food standard policies	High	√
School gardens	High	√
Circular/ nutrition education	Medium	√
School eHealth interventions	High	?
Health promoting schools approach	High	√
Childcare based interventions		
Child feeding interventions delivered by childcare providers	High	√
Parent nutrition education interventions delivered in childcare	High	?
Multicomponent interventions	High	?
Nutrition education	High	?
Child feeding interventions	High	√
Workplace interventions		
Workplace cafeteria interventions	High	√
Specific programme: Total Worker Health (TWH) programme (target work-related safety, health hazards and prevention)	High	√
Primary care interventions		
Counselling: individual or group; via in-person, telephone, web-based, text message, and/or print mailing	High	√

INTERVENTION	REVIEW QUALITY*	EFFECT
After-school community-based nutrition education and skill-based programmes for children and/or families	Medium	?
Cooking lessons/classes (i.e., school- and community-based)	Low	?
eHealth interventions		
Any eHealth intervention	High	✓
Computer-based interventions	High	✓
SMS interventions	High	✓
Internet-based interventions	High	✓
CD-ROM, interventions	High	?
Mobile apps, interventions	High	?
Video game interventions	High	?
Mass media campaigns		
Media	Medium	✓
Choice architecture		
Strategies in school food service, tuck shops and vending machines	Low	?
Information-based cues	High	?
New food retail opportunities		
Mobile Produce markets (MPM)	High	✓
Farmers markets	Medium	?
Retail supermarkets	Medium	X
Agricultural interventions		
Household food production	Medium	✓
Food pricing interventions		
Subsidy	High	✓
Price increase	Medium	X

Notes for the table:

*Review quality assessed using the 12-criteria critical appraisal tool developed by the Joanna Briggs Institute. Reviews meeting <33% of the criteria were rated as low quality, 34–66% as medium quality, and 67% or more as high quality.

✓ Overall, judged as likely to have a positive effect on measures of fruit and/or vegetable intake based on assessment of statistical significance of point estimates in meta-analyses, or summary statements for narrative reviews.

X Overall, judged as likely to have a negative impact on measures of fruit and/or vegetable intake based on assessment of statistical significance of point estimates in meta-analyses, or summary statements for narrative reviews.

? Overall, the effects of the intervention are uncertain.





3.

**POLICIES AND
PROGRAMMES TO
IMPROVE FRUIT AND
VEGETABLE CONSUMPTION
AROUND THE WORLD**

INTRODUCTION

Policies and programmes that aim to improve fruit and vegetable consumption were identified through the NOURISHING database of implemented policies to promote healthy diets and reduce obesity (World Cancer Research Fund), the grey literature – including newsletters from the Global Alliance to Promote Fruit and Vegetable Consumption “5 A Day”, and information requests from international partners of the Healthy Latin America Coalition (HLAC network).

Two researchers reviewed each policy or programme in order to identify if the main objective contributed directly to improving fruit and vegetable consumption. Information was collected from the official sites of each programme and government web sites (e.g. Ministry of Health, Ministry of Education, official regulations, guidelines) and the following data about each initiative was recorded: year of implementation, main objective, actions, target population, level of implementation, (national, local, community, multi-country), setting (schools, point of sales, workplace, health services), region, sector (government, NGO, private sector, academia), inter-sectorality and, if possible, the contact information of key actors or the project leader.

OVER 200 POLICIES AND PROGRAMMES ARE UNDERWAY THAT AIM TO IMPROVE FRUIT AND VEGETABLE CONSUMPTION

Appendix A contains an inventory of 210 policies and programmes, listed alphabetically by country. The numbers of policies and programmes by region are summarized in Table 2 according to the NOURISHING Framework’s policy areas, and this same information is presented in detail in Table 3 (with areas in the NOURISHING Policy Framework where there are no actions greyed out). The presence of evidence to support action in each of the NOURISHING sub-topics is indicated in the final column of Table 3.

Our findings suggest the Americas have the highest number of programmes underway (Table 2), most of which were related to offering healthy food and setting standards in public institutions (“O” in the NOURISHING framework) or informing people about food and nutrition through public awareness (“I”). This same pattern of the dominance of policies and programmes in these two areas was seen in other regions of the world. Actions directed at changing the food system were less common than those directed toward the food environment or behavioural change, with only 9 percent of policies and programmes attempting to harness

food supply chain and actions across sectors to ensure coherence with health (“H” in the NOURISHING Framework).

Two entries had global reach: food-based dietary guidelines (government recommendations for fruit and vegetable consumption) and the Global Alliance for the Future of Food, which is an alliance of mostly private foundations advocating for sustainable food systems. Six pro-

grammes had multiple components and so have been entered under multiple categories of the NOURISHING framework.

TABLE 2: Policies and programmes that aim to increase fruit and vegetables consumption by region and NOURISHING policy framework *subgroup*

REGION N (ROW%)	FOOD ENVIRONMENT						FOOD SYSTEM	BEHAVIOURAL CHANGE COMMUNICATION			TOTAL
	N	O	U	R	I	S	H	I	N	G	
Americas	0	27 (31)	3 (3)	0	0	5 (6)	12 (14)	26 (30)	4 (5)	11 (13)	88
Asia-Pacific	0	32 (54)	1 (2)	0	0	1 (2)	4 (7)	7 (14)	3 (5)	11 (19)	59
Europe	0	28 (50)	1 (2)	0	0	2 (4)	2 (4)	18 (31)	3 (5)	4 (7)	58
Middle East/ Africa	0	2 (22)	0	0	0	0	1 (11)	1 (11)	2 (22)	3 (33)	9
Global	0	0	0	0	0	0	1 (50)	1 (50)	0	0	2
TOTAL	0	89	5	0	0	8	20	53	12	29	216
	102							94			

Notes for the table:

Region: Americas (North America, South America, Central America, the Caribbean), Asia-Pacific (Central and South Asia, Northeast Asia, Southeast Asia, Australia and Oceania), Europe (Northern Europe, Southern Europe, Eastern Europe, Western Europe), Middle East/Africa (Middle East, North Africa, South Africa).

NOURISHING: N= Nutrition label standards and regulations on the use of claims and implied claims on food, O= Offer healthy food and set standards in public institutions and other specific settings, U= Use economic tools to address food affordability and purchase incentives, R= Restrict food advertising and other forms of commercial promotion, I= Improve nutritional quality of the whole food supply, S= Set incentives and rules to create a healthy retail and food service environment, H= Harness food supply chain and actions across sectors to ensure coherence with health, I= Inform people about food and nutrition through public awareness, N= Nutrition advice and counselling in healthcare settings, G= Give nutrition education and skills.

OFFERING HEALTHY FOOD IN PUBLIC INSTITUTIONS (MOSTLY SCHOOLS) WAS A COMMON ACTION TO ENCOURAGE FRUIT AND VEGETABLE CONSUMPTION

Eighty-nine actions in total were aimed at offering healthy food and setting nutrition standards in public institutions (Table 3). Sixty of these programmes (28 percent) were solely in the school setting, and a further 19 (9 percent) included schools alongside other settings. The majority of standards for food in schools were mandatory (n=40) rather than voluntary (n=19), and ten programmes directly provided fruit and vegetables in schools (in addition to or instead of general food programmes).

OVER 40 PERCENT OF CURRENT POLICIES AND PROGRAMMES FOCUSED ON BEHAVIOUR CHANGE OR COMMUNICATION

Fruit and vegetable public awareness campaigns were the second-most common action taken globally to improve fruit and vegetable consumption, with 37 actions underway in this area (Table 3). The “5 a Day” campaign (also known as 5 +A Day, 5 al día, and Give me 5) which encourages people to eat at least five portions of fruit and vegetables every day, was present in Argentina, Brazil, Canada, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, El Salvador, Finland, France, Germany, Honduras, Hungary, Italy, Japan, Mexico, Nicaragua, New Zealand, Norway, Paraguay, Peru, Poland, Portugal, Switzerland, Spain, Tonga, United Kingdom, United States of America, Uruguay and Venezuela. Australia also had a similar campaign called Go for 2&5.

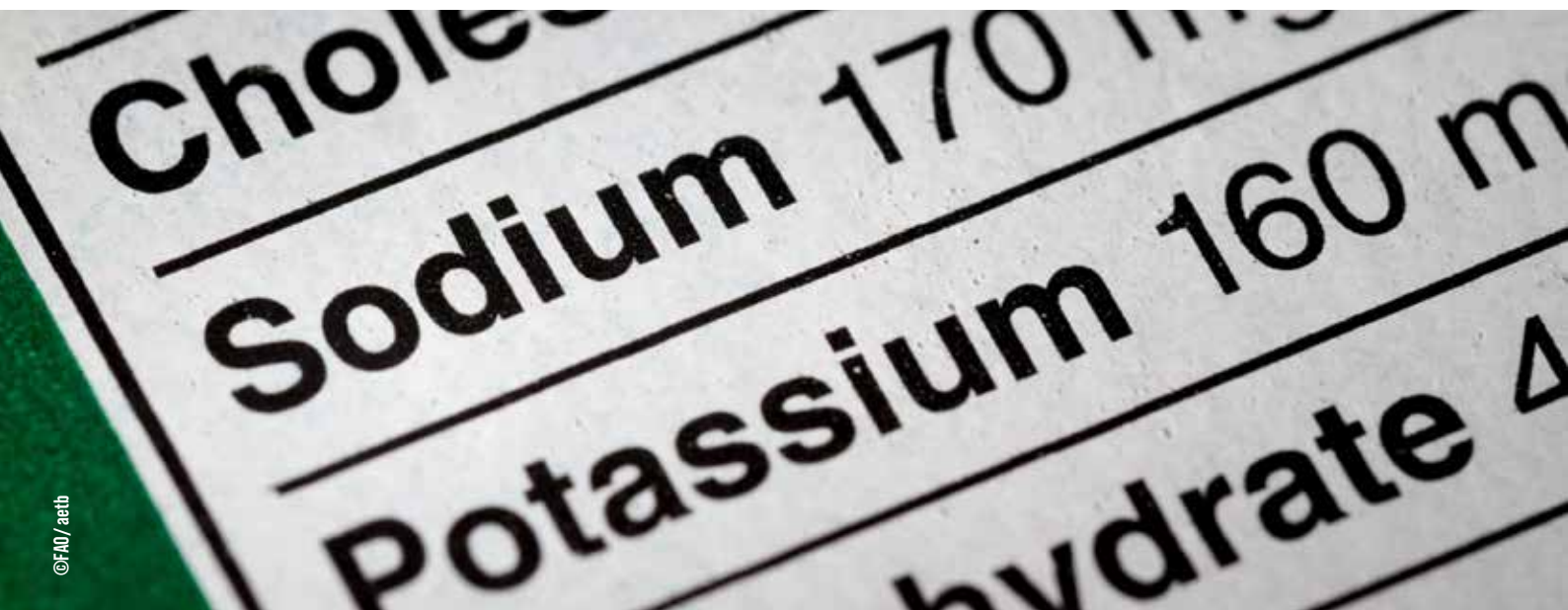


TABLE 3: Policies and programmes to increase fruit and vegetable consumption, by NOURISHING framework policy and sub-policy areas (n= 216 policies), with an indication of existing evidence from the umbrella review

NOURISHING POLICY AREA		SUB-POLICY AREA	NUMBER	EVIDENCE MAPPED*
Food environment (n=102)	N: Nutrition label standards and regulations on the use of claims and implied claims on food	Mandatory nutrient lists on packaged food, Trans fats included in mandatory nutrient labels, Clearly visible “interpretative” labels and warning labels, On-shelf labelling, Warning labels on menus and displays in out-of-home venues, Rules on nutrient or health claims - No policies or programmes found	0	
		Calorie and nutrient labelling on menus and displays in out-of-home venues	0	X
	O: Offer healthy food and set standards in public institutions and other specific settings (n=89)	Fruit and vegetable initiatives in schools	10	X
		Mandatory standards for food available in schools including restrictions on unhealthy food	39	X
		Mandatory standards for food available in schools and in their immediate vicinity	1	
		Voluntary guidelines for food available in schools	19	
		Bans specific to vending machines in schools	1	
		Standards in social support programmes	2	
	U: Use economic tools to address food affordability and purchase incentives (n=5)	Standards in other specific locations (e.g., health facilities and workplaces)	17	X
		Health-related food taxes, voluntary health-related food taxes and increasing import tariffs on specified “unhealthy” food - No policies or programmes found	0	
		Lowering import tariffs on specified “healthy” food	1	
	R= Restrict food advertising and other forms of commercial promotion (n=0)	Targeted subsidies for healthy food	4	X
		No policies or programmes found	0	
	I= Improve nutritional quality of the whole food supply	No policies or programmes found	0	
		No policies or programmes found	0	
	S= Set incentives and rules to create a healthy retail and food service environment (n=8)	Incentives/rules for stores to locate in under-served neighbourhoods	2	
		Initiatives to increase the availability of healthier food in stores and food service outlets	4	
		Incentives and rules to offer healthy food options as a default in food service outlets	1	X
		Planning restrictions on food outlets	1	
		Incentives and rules to reduce trans fat in food service outlets, and restrict sugar-sweetened beverage consumption and reduce salt in food service outlets - No policies or programmes found	0	

NOURISHING POLICY AREA		SUB-POLICY AREA	NUMBER	EVIDENCE MAPPED*
Food system (n=20)	H= Harness food supply chain and actions across sectors to ensure coherence with health (n=20)	Nutrition standards for public procurement	6	
		Public procurement through “short” chains (e.g., local farmers)	4	
		Supply chain incentives for food production	2	
		Supporting urban agriculture in health and planning policies	4	
		Community food production	4	X
		Governance structures for multi-sectoral/stakeholder engagement and Working with food suppliers to provide healthier ingredients - No policies or programmes found	0	
Behaviour change communication (n=94)	I= Inform people about food and nutrition through public awareness (n=53)	Development and communication of food-based dietary guidelines	1	
		Development and communication of guidelines for specific food groups	2	
		Public awareness, mass media and informational campaigns and social marketing on healthy eating	12	X
		Public awareness campaigns specific to fruit and vegetables	38	
		Public awareness campaigns concerning specific unhealthy food and beverages, and those concerning salt - No policies or programmes found	0	
	N= Nutrition advice and counselling in healthcare settings (n=12)	Guidelines and programmes to provide support in primary care to people who are overweight and obese	4	
		Nutrition counselling in primary care	6	X
		Training for health professionals	2	
	G= Give nutrition education and skills (n=29)	Nutrition education on curricula	11	X
		Community-based nutrition education	4	X
		Cooking skills	2	X
		Initiatives to train school children on growing food	7	X
Workplace or community health schemes		1	X	
Training for chefs, caterers and food service providers		4		

Notes for the table:

**Evidence mapped from the systematic reviews included in Table 1 and Appendix B. Note that an omission of an X only means that there is no systematically reviewed evidence (there may be individual studies showing an effect).*

THE UNITED STATES, BRAZIL, AUSTRALIA, AND THE UNITED KINGDOM REPORTED THE HIGHEST NUMBER OF PROGRAMMES AND POLICIES

Among the databases and literature searched, the United States of America (USA) was found to have the greatest number of actions underway (n=33). However, many of the policies and programmes in the USA were only relevant to specific cities or states. Australia (n=15),

the United Kingdom (n=15), and Brazil (n=11) also had high numbers of policies and programmes overall. Many countries in Africa, the Middle East, and Asia did not have policies or programmes aimed at improving fruit and vegetable consumption, but this may be due to the methods used to construct the inventory rather than a true reflection of lack of action.





4.

CASE STUDIES OF PROMISING INITIATIVES



PEAS PLEASE

The Food Foundation UK

Peas Please is a UK-wide partnership initiative working to drive up vegetable consumption at a population level, with a particular focus on children and low-income groups. The initiative aims to improve human and planetary health by making vegetables more available, accessible, and appealing.

Peas Please brings together actors from across the food system: farmers, retailers, manufacturers, restaurant chains, supermarkets, contract caterers and government departments, encouraging them all to make a commitment or “pledge” to grow, sell, or serve more vegetables. Peas Please takes a food systems approach, working across different spheres to increase the

supply, availability and accessibility of veg. So, we work with businesses to increase the supply of veg; with local authorities and communities to support joined-up action at a community level; with individuals (through the Veg Advocate programme) to empower people as agents of change; and at a governmental level by advocating for policy change to support increased vegetable production and consumption and the UK’s horticultural sector. Peas Please was first established in 2017 and currently has funding from charitable foundations to run until 2023.

Over 95 organizations have to date signed up to Peas Please, committing to grow, serve, or sell more vegetables. In total, over 150 organizations have been involved with Peas Please activities at both a national and local level. Between 500-600 people will be reached through Peas Please workshops, of whom 100 adults and young adults will be recruited to support the programme as volunteer Veg Advocates.

Our primary outcome is increasing the availability of vegetables. To measure this, we ask our pledgers to monitor their work and report annually to us on their progress. We also use third-party data to objectively monitor our results using Kantar Worldpanel data, data from the National Diet and Nutrition Survey, and site visits to businesses to ensure accuracy and minimize self-reporting bias. A full programme evaluation will be undertaken by external partners in 2023.

In the period 2017–July 2019, Peas Please pledgers served or sold an additional 90 million portions of veg in the UK. Kantar data showed that while 7.1 percent of average UK shopping baskets were veg in 2018–2019, this rose to 8 percent for retailers who were Peas Please pledgers in 2019. To date we have obtained pledges from 95 UK organizations, including 80 percent of the retail sector, demonstrating how compelling and effective the campaign has been in engaging with food system actors.

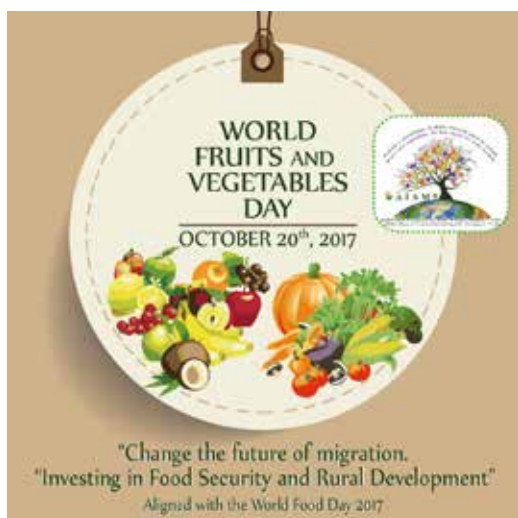
It is too early to say if Peas Please has positively changed vegetable consumption at a population level, but the National Diet and Nutrition Survey data will be monitored in the coming years to explore this potential impact pathway.

Key learning:

Evidence consistently shows that education – while necessary – is not sufficient in achieving lasting behaviour change. Too many policymakers still focus on education and public health messaging to try and change diets, but a focus on changing the food environment is essential to achieve long-lasting change.



©The Food Foundation UK



WORLD FRUITS AND VEGETABLES DAY

AIAM5 Global Alliance for the Promotion of Fruits and Vegetables Consumption

Since 2012, World Fruits and Vegetables Day (WFAVD) has been celebrated on the fifth day of the week in which FAO celebrates World Food Day (WFD). The aim is to raise awareness of the importance of increasing production and consumption of fruit and vegetables to prevent and control NCDs, improve global food security, protect biodiversity and make food systems healthier and more sustainable.

Actions are targeted toward the general population, stakeholders, members of national associations promoting fruits and vegetables (farmers, retail, academia, health professionals, consumers, associ-

ations, etc.), and governments. Each year, the task force leading WFAVD activities issues a press release and a custom logo including a slogan. Activities take place in the community, including distribution of free fruits and vegetables, brochures, and flyers in different settings (schools, workplace, streets, sporting events, etc.). Colombia broke the Guinness World Record in the second year of World Fruits and Vegetables Day by delivering free fruits and vegetables to 50,000 people in seven cities simultaneously. Some countries organize workshops involving children to taste seasonal fruits and vegetables or establish deals with supermarket chains to reduce prices or distribute fruits and vegetables for free. Most members use their social network profiles to engage people through contests, infographics, videos, and challenges. Educational materials, training sessions or cooking workshops on healthy eating are delivered, too. Other actions involve cooking or activities with children, as Spain does within the framework of the Fruit Attraction Fair.

AIAM5 aspires for governments to commit to the initiative, as Costa Rica, Chile, El Salvador, and the municipality of Santa Fe in Argentina have already done, to declare a national Fruits and Vegetables Day, in order to spread the initiative worldwide and to ask FAO to recognize WFAVD. Most members have asked their governments to include that date in their national agendas. In 2019, 17 countries were highly involved, mostly in Latin America and the Caribbean, with most of the 38 AIAM5 members participating in some capacity.

Evaluation of the initiative is challenging as there are few resources allocated to data collection; however, AIAM5 encourages its members to measure their actions at least in term of people impacted or kg/tons of FAV delivered.

A report and some images of every edition are displayed on the WFAVD section of the AIAM5 website: <http://aiam5.com/>



©AIAM5 Global Alliance for the Promotion of Fruits and Vegetables Consumption

5+ A DAY FRUIT & VEGETABLES IN SCHOOLS

United Fresh New Zealand Incorporated, funded by the Ministry of Health

Fruit and Vegetables in Schools (FIS) provides daily fresh fruit and vegetables to students in schools located in the country's lowest socio-economic areas. The initiative was piloted in 25 schools in 2004 and has grown to reach 557 schools (around 25 percent of New Zealand's primary schools) in 21 regions across New Zealand. Over 120 000 children and staff each school day receive a free piece of fruit or vegetable, with over 25 million servings of fresh fruit and vegetables distributed every year.

A wide range of high-quality fruit and vegetables are supplied by wholesale markets to schools with an emphasis on New Zealand-grown seasonal produce. Most schools receive two deliveries per week, on Mondays and Wednesdays, with enough fruit and vegetables supplied to cater for all the students and staff at each school for the week. Alongside FIS, the 5+ A Day Charitable Trust provides educational resources linked to the New Zealand Curriculum. The educational resources include a dedicated education website www.5adayeducation.org.nz and an extensive range of both print and digital materials with a focus on eating

a healthy diet, including plenty of fresh fruit and vegetables, and growing fresh produce at home.

In 2018, an independent evaluation of FIS found that the daily provision of fresh produce ensures that all students have access to healthy food. Children who are hungry struggle to concentrate and learn. Eight out of ten of principals surveyed reported their school or *kura* (Māori language school) had fewer hungry *tamariki* (children) as a result of FIS. Nine out of ten principals said FIS led to a sense of equality among students regardless of their family circumstances. FIS has positive impacts for children at home as well as school:

- 76 percent of the parents surveyed said their child ate more fruit because of FIS
- 47 percent of children also ate more vegetables
- Seven out of ten parents said FIS supports them to provide healthy food at home
- 74 percent of principals said that FIS had been a catalyst for action on other health issues in their school or *kura*.

In 2019, Nielsen Research, a global data analysis company, conducted an independent survey to measure support for FIS amongst New Zealand parents. Eighty-eight percent agreed that FIS

should continue beyond 2019 (only 3 percent opposed the initiative), 83 percent agreed that FIS should continue to be government-funded beyond 2019, and 80 percent agreed that FIS should be extended to higher socio-economic schools.

Despite various political fluctuations, Fruit and Vegetables in Schools has been adopted and supported year-on-year by successive governments. In 2020, with the impact of a global pandemic, food insecurity is of even greater concern across the globe. FIS was able to utilise existing distribution channels to supply fresh fruit and vegetable boxes to vulnerable New Zealand communities throughout our country's COVID-19 lockdown.



©United Fresh New Zealand Incorporated

FARM TO SCHOOL PROGRAMME

(Guatemala and Costa Rica)

Institute of Nutrition of Central America and Panama, through its Research Centre for the Prevention of Chronic Diseases (CIIPEC) with collaboration of the National Institute of Public Health in Mexico, among other partners

The Farm to School Programme was a six- to eight-week intervention to increase fruit and vegetable (F&V) availability, accessibility, acceptability, quality and consumption at public schools in Guatemala City, Guatemala and San José, Costa Rica, through innovative inter-sectoral collaboration and partnerships among producers, retailers, school authorities, parents and students.

A six- to eight-week innovative food system intervention to improve F&V supply and demand in urban public schools. The intervention was adapted to the reality of each country. **Guatemala** (31 schools, July-November 2018): a class-based programme (demand side) and two components on the supply side: increase F&V offer for sale at school kiosks and increase F&V servings in snacks provided by the school, through improvement in

the planning/purchase of F&V from small producers (i.e. app to link producers and buyers) and training kitchen personnel on improved menus and hygiene techniques. **Costa Rica** (34 schools, March-August 2019): a home-based programme (demand side) and, on the supply side, school canteen staff training on improved menus and hygiene techniques, and improvements in the planning/purchase of F&V from the National Provision System (i.e. enhanced computer online platform).

The intervention was moderately effective in increasing the consumption of fruits, but not vegetables. Pre-intervention daily consumption of F&V was higher in Guatemala (251 g) than in Costa Rica (197 g). **Guatemala:** Fruit consumption significantly increased only in boys by more than one serving/day (92 g). Hence, total consumption of F&V reached 85 percent of the WHO recommendation (400 g/day). **Costa Rica:** Fruit consumption significantly decreased in boys and girls ($\frac{3}{4}$ of a serving/day) in the control schools. Girls in the intervention schools maintained the fruit consumption that they had prior to the intervention, suggesting a protective effect (boys same as control). The programme united local production to meet school demand and thus increased the consumption of F&V.

School food programme: Enhancement opportunities should focus on:

Costa Rica: improving administrative processes, so that the programme works better and manages to involve small-scale farmers in the supply chain and reduce intermediation.

Guatemala: connecting producers with schools, in addition to strengthening the programme in various areas: formulation of a budget, design of a menu that meets the needs of schoolchildren, and adequate infrastructure.

Key learning for policymakers:

Increasing F&V consumption in schools is challenging in an environment in which there is great availability and consumption of ultra-processed foods and beverages. Thus, it is necessary to also consider mechanisms that regulate the availability of ultra-processed products.

Society as a whole, particularly civil society, should pressure the legislative assembly in each country to advance legislative proposals towards promoting food and nutrition security. Moreover, the implementation of already approved policies, such as regulations for school kiosks and national fruticulture policies, should be improved and enforced.



© Institute of Nutrition of Central America and Panama, through its Research Center for the Prevention of Chronic Diseases (CIPEC)

HEALTHY FOOD PROMOTION IN LA COUNTY FOOD SERVICES CONTRACTS

Los Angeles County Department of Public Health

The policy, adopted in March 2011, requires the Los Angeles County Department of Public Health (DPH) to review all new and renewing food and vending service contracts within the County to include and comply with healthy nutrition standards and practices, including access to fruits and vegetables. The policy impacts 15 departments that purchase, distribute, serve, or sell food and approximately 37 million meals and snacks per year.

LA County's food service contracts cover worksites, hospitals, vending machines, juvenile detention centres, senior meal programmes, and other food settings. In 2011, DPH developed nutrition standards and sodium reduction strategies for institutional settings. Nutrition standards have been revised multiple times to align with the latest nutrition science and currently include requirements for beverages, snacks, fruit, vegetables, grains, proteins, dairy, and other food categories. DPH's *Nutrition Standards for Prepared Foods, Snacks and Beverages* in-

cludes requirements for fruits and vegetables, including both purchasing and serving standards (Table 4). Behavioural economic approaches, such as requiring fresh fruit to be placed within reach of all checkout registers, are also included.

To guide implementation, DPH provides nutrition technical advice, menu and recipe review, and assessments of food service environments. DPH has convened multiple implementation and culinary trainings to share best practices and developed toolkits and promotional materials (e.g. signage, etc.). In 2018, DPH launched a new social marketing campaign, *Eat Your Best, Less Salt, More Plants* to promote the integration of more plant-based dishes in food service. The initiative promotes serving fresh and delicious plant-based foods as a strategy to reduce sodium consumption. Recipes and salad bar toolkits were developed to promote the use of fresh fruits and vegetables, herbs and spices over processed foods.

Key Learnings and Recommendations

- Adopting nutrition standards can support the institutionalization of nutrition in the government food service contracting process and may impact menus and institutional food purchasing of fruits and vegetables.

TABLE 4: Nutrition standards for Fruit and Vegetables

	FRUIT	VEGETABLES, BEANS, NUTS AND SEEDS
Purchasing standards	Require canned fruit is packaged in unsweetened 100% juice or water, not syrup. Recommend purchasing dried, frozen, pureed, or whole fruits with no added sugars.	Require canned/frozen vegetables and beans, and all nuts/seeds contain ≤ 290 mg sodium per serving.
Serving standards	Require at least three fresh fruit options per meal service, two of which are whole fruit options. Recommend seasonal fruit whenever possible.	Require at least three non-starchy vegetable options that are not fried; at least one raw, salad-type vegetable and at least one steamed, baked, or grilled vegetable daily. Recommend seasonal vegetables whenever possible.
Behavioural approaches	Require fresh fruit to be placed within reach of all checkout registers. Require the identification of plant-based menu items. Recommend the pricing for fresh and pre-packaged salads to be competitive with other entrée options.	

- Policies that adopt healthy food procurement and nutrition standards should include the implementation of behavioural economic approaches, such as product placement strategies to increase consumption of fruits and vegetables.
- Nutrition standards policies should consider requirements for data collection from government departments and contracted food vendors to support evaluation.
- Develop an enforcement mechanism and evaluation plan to assess adherence and the impact of nutrition guidelines implementation.

EAT YOUR BEST COOKBOOK.
LA County DPH Division of Chronic Disease and Injury Prevention, 2018



© Los Angeles County Department of Public Health

HEALTHY START VOUCHERS

National Health Service (NHS)

The Healthy Start scheme in England, Wales and Northern Ireland (with a similar scheme Best Start Foods in Scotland) provides vouchers, which can be exchanged for fresh or frozen fruit and vegetables, plain cows' milk or infant formula, and coupons for free vitamin supplements for pregnant and breastfeeding women and children under four years old.

The programme, which started in 2006, aims to improve the health of low-income pregnant and new mothers, and children under four years old, by providing a nutritional safety net, promoting healthy eating and breastfeeding, and encouraging access to health professionals. Women who are at least ten weeks pregnant or have a child under four years old are targeted for inclusion in the scheme if they or their family are in receipt of qualifying welfare benefits. In 2011, Healthy Start reached 571 674 women and children (80 percent of those eligible); this decreased to 327 375 (66 percent of those eligible) in 2018 (see: <https://www.firststepsnutrition.org/healthy-start>)

Participants in the evaluation of Healthy Start said that it functioned as a nutritional safety net by providing financial support for the purchase of fruit, vegetables, plain

cows' milk and infant formula. For Healthy Start to continue to maintain this intended function, the purchasing power of the value of the vouchers relative to the rising cost of food needs to be safeguarded. Women felt that Healthy Start went some way to meeting its public health aims by increasing the quantity and range of fruit and vegetables in family diets. This impact was reported not only to improve the quality of family diets while receiving Healthy Start vouchers, but also potentially to establish good habits for the future.

Access to Healthy Start for eligible families is critical to it meeting its policy aims and contributing to reducing health inequalities. Low levels of awareness of Healthy Start among the general population and some groups of eligible families (e.g. women who do not speak English and working families on low incomes) was said to be a barrier to increasing uptake.

Women participating in the evaluation valued the inclusion of infant formula as an item that could be purchased with Healthy Start vouchers but this meant vouchers were not used to purchase fruits and vegetables. The economic feasibility study found that analysis of several datasets together could provide good complementary evidence of the impact of vouchers on demand for products that are and are not supported by Healthy Start and usefully inform both current policy debates and future primary research.

Key Learnings and Recommendations

- Index-link the value of the programme benefits to the cost of fruits and vegetables.
- Develop a communication strategy to increase awareness of the programme among the general population, eligible families, health professionals and retailers.
- Evaluate the costs and effectiveness of the programme including the impact on the demand for fruits and vegetables.
- Ensure eligibility thresholds include everyone who could benefit from the programme and monitor uptake among different populations.



©National Health Service (NHS)

EAT THEM TO DEFEAT THEM

VegPower, ITV, Channel 4 and Sky

Eat Them to Defeat Them uses advertising and communications to inspire kids aged 5-11 to eat vegetables and create life-long good food habits. It is a partnership between Veg Power (a community interest company), and broadcasters ITV, Channel 4, and Sky. A national network of national, regional, and local government, retailers, growers, chefs, nutritionists and health workers, media owners, agencies, academics, schools, community groups, and food lovers all contribute to a shared mission. Through this network, around GBP 10 million a year of value for promoting vegetables is unlocked, enabling the promotion of veg in a way no one has done before.

Our approach has four-elements:

1. The mass scale advertising and celebrity support creates a buzz.
2. Our schools programme educates and encourages children to try new vegetables.
3. Our network of experts supports and educates parents to normalize these good habits.
4. Social media affirms and supports all stakeholders.

Our research asked why kids don't eat more vegetables. It showed that kids think they are disgusting, the enemy, an idea reinforced by children's entertainment. Busy parents are concerned about friction at the meal table and food waste. *Eat Them to Defeat Them* is a game, a story, a joke. We told the kids that they were right, veg are the enemy, parents are losing the battle, they need your help.... but the only way to defeat them is to eat them. Kids know it is a ruse but play along. We never mention health or nutrition as they burst the fun bubble.

In 2019, the media campaign reached 30 million people including 65 percent of parents and 44 percent of kids. Our schools programme reached 300 000 kids. In 2020, the media campaign reached 46 million people with 87 percent of households with children aged four to nine seeing the ad ten times. Our schools programme reached 425 000 children in 1 500 schools. We have reached 62 million people on social media and over 10 000 influencers, schools, and community groups support our hashtag.

The primary goal is not an immediate increase in vegetable consumption but to shape the long term, to change culture, perceptions, and values about vegetables—to make them fun. The 2019 evaluation found that 69 percent of kids liked the campaign, 57 percent said it makes vegetables more fun, and 46 percent of kids who had seen the advert said they recently tried more vegetables. Sales data

confirms a 2.3 percent positive impact on sales nationwide (VegPower, 2020). Preliminary results in 2020: 81 percent of school stakeholders said it was more popular than other health eating initiatives.

Advice for others wanting to improve fruit and vegetable consumption:

- Partnerships are key
- Focus on fun
- Be inspirational not educational



©VegPower





5.

IMPLEMENTATION CHALLENGES FOR POLICIES AND PROGRAMMES

INTRODUCTION

A range of factors have been found to impede the implementation of fruit and vegetable interventions (Gerritsen and Harré *et al.*, 2019; Mozaffarian *et al.*, 2018). Implementation barriers vary according to the nature and characteristics of the intervention and the context in which it is to be implemented. Research describing such barriers specific to fruit and vegetable programme implementation is sparse, and so we include here a discussion of such barriers for nutrition related policy and programme implementation more broadly, drawing on the literature, and present a summary of communications with key actors who have implemented policies and programmes in different countries and settings.

Findings from the literature about barriers to implementation

IMPLEMENTATION BARRIERS HAVE BEEN REPORTED IN A RANGE OF COMMUNITY AND CLINICAL SETTINGS

In interviews with school staff to examine barriers to the implementation of an after-school fruit and vegetable intervention, Hastmann *et al.* (2013) reported that

costs to fund additional staff to prepare, serve, and clean up, and concerns regarding food safety were the primary barriers. Similarly, the time taken to prepare and eat during lessons and fruit and vegetable supply issues reportedly impeded the implementation of the in-class school fruit and vegetable interventions (Nathan *et al.*, 2011; Aarestrup *et al.*, 2014) and a lack of funding, curricula resources, knowledge, and skills has also been reported by child-care services staff to hinder fruit and vegetable programmes in that setting (Davis and Brann, 2017). In a survey of 451 Canadian-trained physicians regarding their practices, attitudes, and barriers around implementing nutrition counselling guidelines in primary care practice, nearly all nominated a lack of time and compensation as the greatest barrier to providing nutrition guidance (Wynn *et al.*, 2010). And, in food service outlets, a systematic review identified a range of factors that influence retailers' ability or willingness to employ choice architecture strategies to improve healthy food selection. These included limited knowledge, perceived consumer demand, supplier and food store management variables, and local and federal policy (Houghtaling *et al.*, 2019).

SUBSTANTIAL BARRIERS TO THE INTRODUCTION OR ENACTMENT OF FOOD POLICY, LEGISLATION AND REGULATIONS ALSO EXIST

A Canadian retail subsidy initiative to facilitate access to perishable nutritious food suggested that a lack of regulation regarding retailer pricing caps and compliance with food cost reporting reduced the impact of the programme (Galloway, 2017). Industry opposition, and political lobbying and marketing campaigns to fight policies they consider unfavourable, can also undermine food policy development and implementation and has been cited as a principal source of policy inertia in addressing obesity (Swinburn *et al.*, 2011). Limited resources for implementation and a lack of accountability have been suggested to reduce the impacts of school food standards in Mexico and standards to limit in-

dustrial trans-fats in India (Barquera, Campos and Rivera, 2013; Afshin, Peñalvo and Gobbo *et al.*, 2017). In Fiji, the progress of food policy has been impeded by a lack of support among national leaders, a lack of consultation with relevant stakeholders, and changing and competing political priorities (Latu *et al.*, 2018). For public health programmes more broadly, a review by Bulthuis *et al.* (2020) summarized barriers to ways of organizing (structure), doing (practice), and thinking (culture). Changes in these elements are required to achieve lasting implementation of public health initiatives at scale (Table 5).



TABLE 5: Summary of barriers identified by Bulthuis et al. (2020) to implementation of public health interventions in LMIC at scale

BARRIERS INFLUENCING A CHANGE IN STRUCTURE
Resources: e.g. financial, human, material resources, time. Lack of resources needed for training, implementation, and reaction to unforeseen cost.
Supply chain: unavailability of products necessary for delivery and implementation.
Policies/guidelines: misalignment with policies / guidelines.
Health systems and governance: delays, corruption, limited infrastructure and resources, and poor governance.
BARRIERS INFLUENCING A CHANGE IN PRACTICE
Training and supervision: insufficient or intermittent or ad hoc training and supervision, high-staff turnover, lack of local expertise.
Collaboration: a lack of collaboration can hinder implementation partly through limited ownership.
Research, monitoring, and evaluation: a lack of research can hinder implementation at scale except in cases where political considerations play a major role.
Politics: changes within ministries or political unrest could form a barrier to decision-making related to scale-up.
Leadership: political leadership depends on political will or buy-in and is, therefore, not always present, hindering scale-up.
BARRIERS INFLUENCING A CHANGE IN CULTURE
Sociocultural environment: the sociocultural environment can hinder the scale-up of public health interventions, as social and cultural norms, and preferences may influence the acceptance and support of the intervention when the intervention does not take the sociocultural environment enough into account.
Need/demand for intervention: if there is no need felt by (one of) the stakeholders, scale-up is constrained.

MULTICOMPONENT IMPLEMENTATION STRATEGIES, WITH A STRONG UNDERSTANDING OF UNIQUE LOCAL BARRIERS, MAY ASSIST WITH SUCCESS

There is little evidence to identify the effectiveness of strategies to improve the implementation of fruit and vegetable interventions, or nutrition programmes more broadly. Cochrane reviews provide low certainty evidence that, with multicomponent implementation strategies such as staff training, resources, feedback, leadership and support, improvements in the implementation of nutrition interventions in schools, childcare services, and workplaces can be achieved (Wolfenden *et al.*, 2017; Hodder *et al.*, 2020; Wolfenden *et al.*, 2020). However, the magnitude of improvements is typically modest. The introduction of monitoring systems and mechanisms of accountability is important to facilitate implementation at all levels, and may be particularly important for the successful execution of food policy (Swinburn *et al.*, 2015). Similarly, political commitments have been suggested as necessary for the sustained mobilization of systems and resources to action policy to improve nutrition (Gillespie *et al.*, 2013). A thorough understanding of the context in which an intervention is to be delivered, identifying implementation barriers at multiple levels and selecting support strategies that will overcome them, may maximize fruit and vegetable policy or programme implementation.

Summary of communications with key actors regarding implementation of policies and programmes in different countries and settings

In addition to the literature review, key contact people from the programmes and policies listed in the inventory (Appendix A) were asked to share their experiences in implementing fruit and vegetable policies and programmes. Twenty-three participants provided information on 25 different actions through personal communications. Most of the actions were related to healthy diet promotion (n=19), two were fruit and vegetable provision in schools, two were from the 5 A Day educational campaign, and one was cash transfers to buy fruit and vegetables. In addition, some stakeholders were asked to contribute wording for case studies of the more promising or innovative policies and programmes to showcase the range of activities underway globally to improve fruit and vegetable consumption. The case studies were selected based on their impact and evaluation studies.

POOR FUNDING OR A LACK OF RESOURCES WERE THE BIGGEST BARRIERS TO IMPLEMENTING POLICIES AND PROGRAMMES

Nearly half of the policies and programmes for which additional information was collected faced poor funding and a lack of resources to ensure effective implementation. Two participants reported that competing or changing policy priorities meant that the programme was no longer active (a 5 A Day campaign and a Food Guide), and two others noted that a lack of intersectoral collaboration had hampered implementation (both healthy diet information campaigns). “Healthy Food Promotion in Los Angeles County” reported differences among County department’s internal administrative processes, issues with County budgets and contracting processes, and implementation challenges with smaller-scale food vendors. Finally, only one actor stated that there were minimal barriers as the programme was a joint programme by interested agri-food and health stakeholders.

STAKEHOLDER COMMITMENT WAS THE MAIN SUCCESS FACTOR FOR IMPLEMENTATION OF POLICIES AND PROGRAMMES

Thirteen contributors cited stakeholder commitment as the key facilitator for successful implementation, and a further five noted that strong political leadership was critical. Two participants noted that “rule of law” was the main contributor to success (for publication of dietary guidelines, and for a multisectoral information campaign). Two participants did not mention any success factors for their programmes; one because the programme had just been launched and so not yet evaluated, and the other noting that the programme (a multicomponent childhood obesity strategy) was not successful in relation to improving diet. For example, “5 a Day, Mexico” reported that the intersectoral commitment between the private and productive sectors had been a factor for success, and “Healthy Food Promotion in Los Angeles County” reported that institutionalization of nutrition in the County’s food service contracting process with food vendors had impacted food purchasing and a strong partnership with key stakeholders had assisted implementation.



6.

DISCUSSION

SUMMARY OF FINDINGS

Inadequate intake of fruit and vegetables is a major contributor to death and disability globally (Afshin *et al.*, 2019). While the determinants of fruit and vegetable intake are complex, dynamic, and operate at multiple levels of the food system, systematic reviews have identified a number of interventions that are capable of improving consumption of fruits and vegetables. Specifically, we found evidence from reviews to support the effectiveness of interventions within schools, childcare services, homes, workplaces, and primary care as well as eHealth interventions, mass media campaigns, household food production strategies, and fiscal initiatives. Systematic review evidence assessing the effects of interventions targeting a number of more macro level determinants, particularly those targeting food system level factors were not available, and the coverage of systematic review evidence can be mapped to only a fraction of the recommended intervention options to improve public health nutrition contained in the NOURISHING Policy Framework.

A collation of policy actions undertaken by countries revealed that initiatives to improve intake vary both across jurisdictions, with policy actions less apparent in African and Middle Eastern regions, and by the type of actions undertaken. Globally, such actions are largely focused on offering healthy food and setting standards in public institutions, in particular schools, and informing people about food

and nutrition through public education and media campaigns. Actions directed at changing the food system represented a small fraction of all actions reported.

A range of factors impedes the implementation of fruit and vegetable interventions, and these vary according to the nature and characteristics of the intervention and the context in which they are to be implemented. Given the limited evidence base on the effects of implementation strategies, maximizing the impact of approaches to improve the implementation of policies and programmes requires a thorough understanding of barriers and the careful selection of strategies to address these.

RESEARCH EVIDENCE AND POLICY AND PRACTICE GAPS

Use of the NOURISHING framework to compare the alignment between current fruit and vegetable policy actions and the existence of systematic review evidence identified a number of areas of alignment and divergence. The most frequently reported actions globally were those related to school-based interventions, particularly related to fruit and vegetable initiatives and food standards in these settings, and public awareness and mass media campaigns. Broadly, systematic review evidence exists for these interventions and suggests that they are effective in im-

improving fruit and vegetable intake, supporting greater international expansion of these initiatives. However, globally, the proportion of countries with school-based fruit and vegetable schemes has fallen considerably in recent years and is present now in just 13 percent of African and 16 percent of Eastern Mediterranean nations (WHO, 2018). Furthermore, in some Latin American countries, schools may only operate for 4-5 hours per day without food service or dedicated periods for lunch (Safdie *et al.*, 2013; Barrera *et al.*, 2016). The applicability of existing evidence-based fruit and vegetable interventions for some countries may, therefore, be limited.

Policy actions were also common for behaviour change interventions focused on nutrition education, including community-based nutrition education (e.g. after-school programmes), cooking skills (cooking classes), and initiatives to train children on growing food (community/school gardens). A focus of global action in these areas in preference to other environmental or food system interventions is consistent with previous global surveys and audits including in low- and middle-income countries (Mason-D'Croz *et al.*, 2019; Lachat *et al.*, 2013). However, evidence from systematic reviews for these types of interventions is equivocal. The effects of such interventions are also typically small, less durable, and can be difficult and costly to scale-up to a level that may meaningfully contribute to changes at a population level. The inclusion of nutrition education initiatives as

part of a broader strategy to improve public health nutrition is therefore required (Mozaffarian *et al.*, 2018).

There were very few policy actions underway for other types of interventions where systematic reviews provided clear evidence of benefit such as targeted food subsidies. For the NOURSHING framework sub policy actions aligned to the food system, and the environment (aside from those captured by the broad environment policy area of "Offer healthy food and set standards in public institutions and other specific settings") there were very few policy actions identified globally, and typically no systematic review evidence available. The lack of systematic review evidence for such interventions may reflect a lack of primary studies evaluating their impact. Complex adaptive interventions do not lend themselves to conventional research designs, such as randomized trials (Greenhalgh and Papoutsis, 2018), and changes in dietary behaviours may be difficult to quantify and attribute (Swinburn *et al.*, 2015). Nonetheless, food systems and the environment have potentially profound impacts on diet (Swinburn *et al.*, 2019). Natural experiments and post-hoc analyses of changes in national policies, international trade agreements, changes in supply chains, or shifts in agricultural practices that interrupt or modify the food system to promote or impede fruit and vegetable availability, accessibility, and intake would provide valuable evidence to help quantify their potential impact.

Neither the NOURISHING framework nor interventions identified via systematic reviews examined other macro-system influences – such as transport systems, land use, and urban design – that may interact with the food system or other determinants of population fruit and vegetable consumption. A recent Lancet Commission report applied a systems thinking perspective to describing the global syndemic of obesity, undernutrition and climate change. The report noted the role of feedback loops within global systems contributing to the syndemic, including governance feedback loops determining how political power translates into policy; business feedback loops which determine the dynamics of creating profitable goods and services; supply and demand feedback loops; ecological feedback loops regarding the environmental impact of other systems on natural ecosystems; and human health feedback loops that show the impact of these systems on health (Swinburn *et al.*, 2019). Strategies that seek to modify these feedback loops, including reducing corporate power (Moodie *et al.*, 2013) or the development of more ecologically sustainable business and transport systems to promote local food production, may be more transformational.

Additionally, there was little evidence as to the effectiveness of programmes and policies in LMIC, many of which are undergoing a “nutrition transition” from traditional diets to Western ultra-processed diets (B. M. Popkin, 2015), and are subject to aggressive food and beverage marketing (Reeve *et al.*, 2018; Barrera *et al.*, 2016).

LIMITATIONS OF THIS REPORT

This report should be interpreted in the context of a number of limitations. The review of policy actions undertaken in the report did not include policies or programmes not explicitly directed towards increasing fruit and vegetable consumption, but other policy actions could have an important impact on transforming the food environment that may influence fruit and vegetable consumption. Examples of these wider actions are fiscal policies to increase the price of sweetened sugary drinks and junk food (Batis *et al.*, 2016; Colchero *et al.*, 2017), front-of-pack warning labels (such as those implemented in Chile (Taillie *et al.*, 2020), Peru, Mexico, and Uruguay), and regulatory measures, such as the banning of junk-food marketing (including cartoons, actors, sports idols, etc.) in Chile, Peru, and Mexico. Similarly, a number of interventions that have been shown to have a beneficial impact on dietary intake more broadly, such as marketing restrictions (Sadeghirad *et al.*, 2016), may also have an impact on fruit and vegetable intake. Furthermore, as an umbrella review, we utilized analyses reported within the included reviews, and did not re-examine or analyse primary studies. As such, the identified gaps in the evidence-base for some interventions may reflect the lack of systematic reviews of these interventions rather than the absence of primary studies. The review was also restricted to prospective evaluations of interventions. Some interventions, including those targeting modification of the food supply

may not be readily amendable to evaluation using conventional prospective designs. The included systematic reviews also largely examined interventions that were more commonly implemented in high-income countries, and most of the studies included in these systematic reviews were from high-income nations, reflecting the available published literature. The global applicability of the findings of some interventions therefore may be limited and underscores both the need for primary studies and reviews specific to interventions undertaken in LMIC.

RECOMMENDATIONS

Improving human and planetary health requires a food transformation and shift towards more plant-based diets, including greater intake of fruits and vegetables (Willett *et al.*, 2019). The findings of this review of the literature and global implementation of policies and programmes suggest that while there remains considerable scope for further action globally, governments have a range of evidence-based policy options to improve fruit and vegetable intake. We provide the following broad recommendations to facilitate population-level improvements in fruit and vegetable consumption.

1. **Employ a comprehensive range of policy actions targeting multi-level determinants of fruit and vegetable intake and incorporate strategies**

across the food environment, food system and behaviour change communication domains of the NOURISHING Framework.

- a) Move beyond actions focused on school, education, and media campaigns to also include strategies that ensure fruits and vegetables are more accessible and affordable to the population.

Media campaigns, setting-based, and other behaviour change-focused interventions found to be effective in the umbrella review should be pursued by countries where these are not being implemented. In countries where they do exist, policymakers should look for opportunities to further enhance their impact. In Australia, for example, embedding dietary interventions into the existing technological infrastructure of schools, childcare services, or food outlets has been found to improve the packing of healthy foods, such as fruits and vegetables by parents in children's school lunch-boxes (Sutherland *et al.*, 2019); the provision of fruit by childcare staff and its consumption by children (Yoong *et al.*, 2020; Grady *et al.*, 2020); and the purchasing of healthy foods via online food ordering systems (Delaney *et al.*, 2017). Improvements were reported despite a number of public health nutrition initiatives already occurring in these settings. In the

health sector, modification of electronic decision support systems have also contributed to improvements in clinician advice to eat more fruits and vegetables (Wiggers *et al.*, 2017). Interventions such as these that offer the potential to reach large numbers of children and adults at a relatively low cost should be examined to strengthen existing evidence-based approaches.

Evidence supporting subsidies and household food production strategies were identified in the umbrella review. However, broader food system influences, including agricultural practices and trade agreements, are major drivers of fruit and vegetable intake, and policies that target such factors are likely to be required in order to achieve large and sustained shifts in population consumption. Existing agricultural policies and trade agreements have supported the production of commodities at large scale that are easy to store and transport, increasing their availability and affordability, leading in many countries to a transition from traditional and plant-based diets to the over-consumption of ultra-processed foods (Baker and Friel, 2014). Improving food systems through the use of agricultural policies and incentives that promote local food production, processing and supply chains, value chain development of nutrient

rich food crops, and investment in cold chain infrastructure to reduce food loss and waste have all been recommended to improve public health nutrition broadly (FAO and WHO, 2018), and are likely to also enhance population intake of fruits and vegetables. Similarly, lower tariffs for fruits and vegetables and increased import tariffs on foods high in fat, salt, and sugar have been suggested (FAO and WHO, 2018). The Aid for Trade initiative has also been proposed as a potential mechanism to improve fruit and vegetable supply through the use of technical assistance to improve the quality of produce, upgrading infrastructure to facilitate market transfer, and supporting the development of supportive policy for agricultural production and export (Thow and Priyadarshi, 2013). Trade-related investments that reduce post-harvest losses have been suggested to improve fruit and vegetable availability locally (Thow and Priyadarshi, 2013).

b) Prioritize interventions with the greatest potential for beneficial impact, that is, those that are cost-effective, contextually relevant, with population-level reach, and where impacts do not exacerbate inequalities and are likely to be enduring.

Governments have finite resources and the selection of fruit and vegetable interventions to imple-

ment should seek to maximize the impact of such investments. While there have been relatively few studies examining cost-effectiveness, a number of interventions have been reported to be cost-effective from a health system perspective. A review of interventions targeting adults from an Australian health sector perspective reported that some general community awareness interventions (mailings and community-based events) and worksite (cafeteria and modification and promotion) interventions were considered cost-effective (<AUD 50 000/DALY) but supermarket displays, flyers, and dietary counselling interventions, farmer's market vouchers, and a subsidy on all fresh and preserved fruits and vegetables were not (Cobiac, Vos, and Lennert Veerman, 2010; Cobi-

ac *et al.*, 2017). In the Netherlands, school-based fruit and vegetable interventions have been found to be cost-effective (Hodder *et al.*, 2020). In the United States of America, community-supported agriculture initiatives for low-income populations (where individuals purchase a "share" of a farm's produce to receive during the growing season), and subsidized fruit and vegetable purchases through Nutrition Assistance Programmes, are likely to be cost-effective from a health sector perspective and cost-saving from a societal perspective (Choi, Seligman, and Basu, 2017).

Nonetheless, considerations beyond cost-effectiveness needed to be weighed when selecting interventions. Cost-effectiveness ratios may be more favourable for infor-



mation campaigns and some fiscal strategies. However, both may exacerbate health inequities, while food stamp policies may reduce inequities but are less cost-effective (Dallongeville *et al.*, 2010). Equity-focused health impact assessments may be useful tools to support the selection of a suite of interventions based on consideration of their potential equity impacts (Simpson *et al.*, 2005). The potential reach of an intervention is also an important consideration in the selection of interventions with the capacity to contribute to national-level improvements in fruit and vegetable intake. Tools have recently been published to assess the “scalability” of effective fruit and vegetable programmes, that is, their ability to be expanded under real world conditions to reach a greater proportion of the population, while retaining effectiveness (Milat *et al.*, 2013). For example, the Intervention Scalability Assessment Tool (ISAT) includes domains characterizing the context in which the intervention is to be scaled-up, as well as implementation and scale-up requirements, and may aid in the selection of interventions and processes to deliver at scale suitable to local country contexts (Milat *et al.*, 2020).

c) Counter other macro policies, processes and systems that adversely impact on fruit and vegetable intake – for example, mar-

ket intrusion by transnational processed-food corporations whose foods displace or limit fruit and vegetable consumption.

The food industry and other vested interests may be strong opponents to the introduction of policies to modify food systems and environments, and can undermine political commitment for action. Such influence is exerted through political lobbying and donations, adopting self-regulation to delay government action, and partnerships with government to influence policy (Baker *et al.*, 2020). Trade liberalization can also empower industry to limit the scope of regulatory approaches to improve public health nutrition (Baker *et al.*, 2020). Aggressive industry opposition has been reported to restrictions on unhealthy food marketing to children (Moodie *et al.*, 2013), and food labelling systems (Magnusson, 2010), and may have indirectly but adversely impacted fruit and vegetable intake (Boynton-Jarrett *et al.*, 2003). Furthermore, initiatives that seek to reduce the impact of the unhealthy ultra-processed foods industry, such as taxation on these products, may improve population consumption of fruits and vegetables, particularly if the revenue generated is directed towards fruit and vegetable promotion policies (Waterlander *et al.*, 2019; Popkin, 2019). Governance and policymaking processes

that are transparent, independent of industry influence, accountable, and in the interest of community well-being are of utmost importance (Swinburn *et al.*, 2015).

d) Look for cross-sectoral opportunities to promote healthy diets and fruit and vegetable intake, for example, as part of environmental or climate change policies.

The recent Lancet Commission has noted that obesity, under-nutrition, and climate change are interconnected with common drivers (food, transport, urban design, and land use), and called for strategies that focus on and achieve double- or triple-duty actions impacting these pandemics (Swinburn *et al.*, 2019). Achieving optimized (largely plant-based) diets that consider both human and planetary health, in line with the Lancet EAT Commission recommendations (Willett *et al.*, 2019), will require significant modification to food, agriculture, and trade systems. The activities of FAO, the World Trade Organization, World Bank, the Intergovernmental Panel on Climate Change, and other influential organizations may have a considerable impact on food systems and environments that promote and impede the availability and affordability of fruits and vegetables (Swinburn *et al.*, 2019). Such organizations and existing international agreements

and infrastructure to support achievement of the Sustainable Development Goals, the Global Action Plan for the Prevention of NCDs, commitments of the UN Decade of Action on Nutrition, and the Paris Agreement can be leveraged to better support public health nutrition through enhancing fruit and vegetable intake. Similarly, consideration should also be given to opportunities to leverage existing organizations and structures at the national and sub-national level, or the need for the creation of new organizations and structures to fill important gaps.

2. Employ comprehensive, multi-level strategies to support the implementation of government policy initiatives.

a) Implementation strategies should be developed to address specific barriers to implementation in the local context.

Strategies to facilitate implementation will need to be developed to address implementation barriers specific to the intervention and the context in which it is to be enacted or delivered. Strategies with a capacity to address more impediments to implementation may be most likely to be successful. A number of examples of successful “at scale” implementation of fruit and vegetable interventions have been

reported in the literature, including those undertaken in schools (Nathan *et al.*, 2012) and household food production initiatives (Tallukder *et al.*, 2000). Research has also been undertaken to examine the scale-up of fruit and vegetable distribution systems (Clark and Inwood, 2016). Such studies may provide important learnings for others working in these sectors. However, as countries will vary in the resources and infrastructure available to implement interventions, the WHO ExpandNet has a number of tools and resources and describes generic processes countries can undertake to scale-up the implementation of fruit and vegetable interventions (WHO, 2010). To guide actions as part of the UN Decade of Action on Nutrition, implementation should rely on securing: i) expressed written and verbal commitments from political leaders and government officials to time-bound, measurable targets or actions; ii) the translation of these into institutional commitments, including policies, plans, empowered systems, or institutions for mobilizing, coordinating, and monitoring actions; and iii) operational commitments, including allocation of budgets, investment in professional development, and enforcement of laws and regulations (WHO and FAO, 2018; Baker *et al.*, 2018).

b) Evaluate and share experiences from implementation efforts to facilitate learning and improvement.

Given the limited evaluation of strategies to implement nutrition interventions broadly, and fruit and vegetable interventions specifically (Wolfenden *et al.*, 2019; 2020; 2017), such research should be a priority in order to best guide future efforts. This could be supplemented with extending mechanisms of reporting against international, national, or subnational commitments to also include a synthesis and dissemination of lessons learned (Willett *et al.*, 2019). Supporting communities of practices locally or regionally would also enable rapid networking, the sharing of ideas, lessons, and experiences, and facilitate collective improvement.



APPENDIX

APPENDIX A: Inventory of policies and programmes around the world to improve fruit and vegetable intake

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Argentina	5 a Day	Increase consumption of F&V	To promote the consumption of at least five daily servings of fruits or vegetables: a balanced diet, rich in vegetables, is one of the pillars of good health	Home, school, workplace, mass media	General	2001	NGO	Inform people about food and nutrition through public awareness
In over 90 countries globally (Herforth et al., 2019)	Dietary Guidelines	Healthy eating promotion	To provide food-based dietary guidelines as an information and communication tool involving the translation of recommended nutrient intakes or population targets into recommendations for the balance of food that populations should be consuming for a healthy diet	NA	General	Diverse	Government	Inform people about food and nutrition through public awareness
Australia	ACT Public School Food and Drink Policy	Healthy diet promotion	To provide and sell healthy food and drinks in ACT public schools	School	Children	2007	Government	Offer healthy food and set standards in public institutions
Better Choice Healthy Food and Drink Supply Strategy	Healthy diet promotion	To increase supply and promotion of healthy foods and drinks and decrease supply and promotion of energy-dense, nutrient-poor choices in all food supply areas including food outlets, staff dining rooms, vending machines, tea trolleys, coffee carts, leased premises, catering, fundraising, promotion and advertising in Queensland Health facilities and workplaces	Workplace and health facilities	General	2019	Government	Offer healthy food and set standards in public institutions and other specific settings	

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Australia	Healthy Food and Drink Policy	Healthy diet promotion	To promote healthy eating within the school community and develop and implement school-based policy for the provision of healthy food and drinks which meets the "green" standard and increase the availability of healthy food and drink choices for staff, volunteers and visitors to ACTPS (Australian Capital Territory Public Sector) workplaces, facilities, activities and functions.	School and workplace	Children and workers	2007 and 2016	Government	Offer healthy food and set standards in public institutions. Offer healthy food and set standards in public institutions.
Australia	LiveLighter	Healthy diet promotion	To encourage people to eat healthily and be physically active to maintain a healthy weight through LiveLighter's website, social media, advocacy and provocative radio, print and TV advertisements	Mass media	General	2012	Government	Inform people about food and nutrition through public awareness
Australia	National Healthy School Canteens: guidelines for healthy food and drinks supplied in school canteens	Guidelines	To give advice on the quality and quantity of foods and drinks recommended for children in Australia to achieve optimal health and limit the risk of chronic diseases related to poor nutrition in adulthood	School	Children	2011	Government	Offer healthy food and set standards in public institutions and other specific settings
Australia	Queensland's Smart Choices	Guidelines	To offer healthy food and drink choices to students in Queensland schools	School	Children	2004	Government	Offer healthy food and set standards in public institutions
Australia	South Australia Right Bite, Easy Guide to Healthy Food and Drink Supply for South Australian Schools and Preschools	Healthy diet promotion	To promote healthy eating by classifying food into three categories according to their nutritional value	School	Children	2008	Government	Offer healthy food and set standards in public institutions and other specific settings

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Bahrain	Australia	Australia	Australia	Australia	Austria	Bahrain	Bahrain	Bahrain
Ministry of Health of Bahrain	The Australian Curriculum	VegKIT	VegEze	Unser Schulbuffet (Our School Buffet) programme	VegKIT	Ministry of Health of Bahrain	Government	Offer healthy food and set standards in public institutions
Desensitize ultra-processed food and beverages consumption	Education and healthy diet promotion	Education	Healthy diet promotion	Healthy diet promotion	Healthy diet promotion	Ministry of Health of Bahrain	Government	Offer healthy food and set standards in public institutions
To regulate food and drinks in schools	To help all young Australians to become successful learners, confident and creative individuals, and active and informed citizens. Presented as a developmental sequence of learning from Foundation. Topic of Personal, Social and Community Health: 1) grouping foods into categories such as food groups and "always" and "sometimes" foods 2) examining their own eating patterns by researching The Australian Guide to Healthy Eating and identifying healthier food choices	To increase vegetable intake among Australian children	To tackle Australia's poor vegetable intake, challenging users to eat more vegetables through a three-week challenge	To improve school cafeterias food and drink basket based on a guideline published by the Federal Ministry of Labour, Social Affairs, Health and Consumer Protection while considering their individual environment aiming at sustainable improvements based on healthy nutrition recommendations and their economic viability.	To increase vegetable intake among Australian children	Ministry of Health of Bahrain	Government	Offer healthy food and set standards in public institutions
School	School	Community	All	School	Children and adolescents	School	School	School
Children	Children	Children	General	Children and adolescents	Children	Children	Children	Children
2016	2015	2019	2018	2012	2019	2016	2019	2016
Government	Government	NGO, academia, and government		Government	Government	Government	Government	Government
Offer healthy food and set standards in public institutions	Give nutrition education and skills	Give nutrition education and skills	Inform people about food and nutrition through public awareness	Offer healthy food and set standards in public institutions and other specific settings	Give nutrition education and skills	Offer healthy food and set standards in public institutions	Give nutrition education and skills	Give nutrition education and skills

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Belgium	School food policy standards and guidelines Be-Wallonian	Healthy diet promotion	To promote healthy eating at schools	School	Children	2013	Government	Offer healthy food and set standards in public institutions
Belgium	School food policy standards and guidelines Flanders	Healthy diet promotion	To promote healthy eating at schools	School	Children	2008	Government	Offer healthy food and set standards in public institutions
Belize	Plenty Belize	Education, provision and healthy diet promotion	To create sustainable development of the people, communities, and environment	School	General	2002	Government and NGO	Give nutrition education and skills
Bermuda	Food Service Providers Contract	Healthy diet promotion	To regulate food and drinks in schools	School	Children	2009	Government	Offer healthy food and set standards in public institutions
Bermuda	Government Vending Machine Policy	Desensitize ultra-processed food and beverages consumption	To ensure access to healthy snacks and beverages for government staff	Government offices	General	2008	Government	Offer healthy food and set standards in public institutions
Bermuda	Healthy Schools in Bermuda	Provision and accessibility	To provide healthy breakfast to at-risk school-age children	School	Children	2008	NGO and government	Offer healthy food and set standards in public institutions

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Bermuda	Healthy Schools Nutrition Policy	Healthy diet promotion	To regulate food and drinks in schools	School	Children	1997	Government	Offer healthy food and set standards in public institutions
Bhutan	Vegetables Go to School (VGtS) (known as VeGoTs in Bhutan) school garden programme in Bhutan.	Provision and education	To address malnutrition among Bhutanese children through a comprehensive school garden programme	school	Children	2002	Government	Give nutrition education and skills
Brazil	Brazil's School Health Programme	Education and healthy diet promotion	To contribute to the integral training of students through actions of promotion, prevention and health care, with a view to facing the vulnerabilities that compromise the full development of children and young people in the public school system	School	Children of elementary school	2007	Government	Give nutrition education and skills
Brazil	Brazilian Unified Health Systems	Healthy diet promotion	To promote healthy eating, evaluate food intake and anthropometry of individuals in all stages of life, prevent and control nutritional deficiencies and obesity, and provide nutritional counselling. To support and structure this work, the government provides manuals, materials, and self-learning courses on these topics for health professionals and transfers funds to municipalities annually	Health service	General	1990	Government	Give nutrition advice and counselling in healthcare settings
Brazil	Lei nº 11.947/2009 – PNAE – Programa Nacional de Alimentação Escolar	Healthy	To contribute to biopsychosocial growth and development, learning, school performance and the formation of healthy eating habits of students, through actions of food and nutrition education and the provision of meals that cover their nutritional needs during the school year	School	Children: students enrolled in elementary public schools	2009	Government	Harness food supply chain and actions across sectors to ensure coherence with health

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Brazil	Ordinance No 1.274 of 7 July 2016	Healthy eating promotion, provision and desensitize ultra-processed food and beverage	To address overweight, obesity and non-communicable diseases, and is based on the right to adequate food. The guidelines are based on the Food Guide for the Brazilian Population, and state that only unprocessed and minimally processed food may be procured	Workplace	General in Ministry's facilities and in its entities	7 July 2016	Government	Harness food supply chain and actions across sectors to ensure coherence with health
Brazil	Plano Nacional De Segurança Alimentar E Nutricional (Plansan 2016-2019)	Provision and accessibility, healthy eating diet	To respect, protect, promote, and provide the Human Right to Adequate Food for all people in Brazil	Community	General	2016	Government	Harness food supply chain and actions across sectors to ensure coherence with health
Brazil	Programmea Brasileiro de Modernização do Mercado Hortigranjeiro	Provision and accessibility	To contribute to the development and modernization of the national horticultural sector, providing greater interaction between the various government agents involved and the members of the production and distribution chain, in addition to improve and expand the functions of wholesale markets	Community	General	Ordinance No. 171, 2005 Ordinance No. 339, 2014	Government	Harness food supply chain and actions across sectors to ensure coherence with health
Brazil	Programa de Aquisição de Alimentos (PAA), art. 19 da Lei nº 10.696	Healthy diet promotion, provision	To promote or access food and encourage family farming among families and people in situations of food and nutritional insecurity and those served by the social assistance network, public food and nutrition security equipment, and the public and philanthropic education network	Community	General	2003, amended 2011 and regulated by several decrees in 2012.	Government	Harness food supply chain and actions across sectors to ensure coherence with health

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Canada	Eat Well Campaign	Healthy diet promotion	To promote healthy eating by providing consumers with information to help them make healthier choices at home, at the grocery store and when eating out	Mass media	General	2013	Government	Inform people about food and nutrition through public awareness
Canada	British Columbia's School Fruit & Vegetable Nutritional Programme	Fruit and vegetable provision	To increase fruit and vegetable consumption	School	Children	2005	Government	Offer healthy food and set standards in public institutions
Brazil	Resolution no. 38	Desensitize ultra-processed food and beverages consumption	To promote healthy diets	School	Children	2009	Government	Offer healthy food and set standards in public institutions
Brazil	Ordinance No 1.274 on Healthy Food Procurement	Increase consumption of F&V Healthy diet promotion	To promote workers' health and reduce the number of injuries related to chronic non-communicable diseases and their modifiable risk factors, especially, overweight, obesity, and inadequate nutrition	Workplace	Workers	2016	Government	Offer healthy food and set standards in public institutions
Brazil	Healthy Schools Canteens Manual	Healthy diet promotion	To promote healthy eating in canteens	School	Children	2010	Government	Offer healthy food and set standards in public institutions
Brazil	5 a Day	Increase consumption of F&V	To promote the consumption of fruit and vegetables	Schools, workplace, chain of stores	General	2004	Government and NGO	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
CARICOM	Caribbean Wellness Day	Healthy diet promotion	To raise awareness of healthy lifestyle options, including promoting healthy food choices, every year on September 13	Mass media, school	General	2007	Government	Inform people about food and nutrition through public awareness
Canada	Nutrition North Canada (NNC)	Subsidies	To help provide Northerners in isolated communities with improved access to perishable, nutritious food	Community	Vulnerable population	2011	Government	Use economic tools to address food affordability and purchase incentives
Canada	Nutrient Criteria for Foods and Beverages in Schools	Healthy diet promotion	To improve the dietary quality of foods and beverages available to students	School	Children	2013	Government	Offer healthy food and set standards in public institutions
Canada	Northern Fruit and Vegetable Programme (NFVP)	Fruit and vegetable provision	1. To increase consumption and awareness of fruits and vegetables among elementary school students in Northern Ontario 2. To educate around the consumption of fruits and vegetables, healthy eating and regular physical activity 3. To provide resources to children and their families around the importance of fruit and vegetable consumption and regular physical activity for good health and the prevention of chronic diseases	School	Children	2006	NGO and Government	Offer healthy food and set standards in public institutions and other specific settings
Canada	Manitoba's Vegetable & Fruit Snack Programme	Fruit and vegetable provision	To increase vegetable and fruit intake for children and youth	School, community places, and licensed child care facilities	Children and youth	2008	Government	Offer healthy food and set standards in public institutions
Canada	Half your plate	Increase consumption of F&V	To help Canadians eat more fruits and vegetables	Social media	General	2014	NGO and private sector	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Costa Rica	5 a Day	Increase consumption of F&V	To promote the consumption of fruits and vegetables	Mass media, local markets	General	2006	Government	Inform people about food and nutrition through public awareness
Colombia	5 a Day	Provision	To promote the consumption of fruit and vegetables	Supermarkets, schools and community	General	2008		Inform people about food and nutrition through public awareness
Chile	The Chilean national food-based dietary guidelines	Healthy diet promotion	To achieve the goals established by the WHO in the 2004 Global Strategy on Diet, Physical Activity and Health, which seek to contribute to achieving an energy balance and a normal weight for people; limit energy intake from fats, replace saturated fats with unsaturated fats; try to eliminate trans-fatty acids; increase the consumption of fruits and vegetables, legumes, whole grains and nuts; limit your intake of free sugars and your intake of salt (sodium)	Health service	General	2005, 2013	Government and academia	Give nutrition advice and counselling in healthcare settings
Chile	Law of Nutritional Composition of Food and Advertising (Ley 20.606)	Desensitize ultra-processed food and beverages consumption	To protect the health of the population, especially of children and young people, given the alarming prevalence of obesity and chronic diseases no transmissible, derived from poor nutrition	School	Children	2012	Government	Offer healthy food and set standards in public institutions
Chile	5 a Day	Increase consumption of F&V	To promote the development of good eating habits through the implementation of the 5 a Day Programme in Chile, with an emphasis on the consumption of five or more servings of fruits and vegetables a day, in the context of a healthy life	Mass media, points of sale and schools	General	2004	Academia and private sector	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Costa Rica	Decree No. 36910-MEP-S	Desensitize ultra-processed food and beverages consumption	To promote healthy food in schools	School	Children	2012	Government	Offer healthy food and set standards in public institutions
Cuba	5 a Day	Increase consumption of F&V	To promote the consumption of fruits and vegetables	Mass media	General		Government	Inform people about food and nutrition through public awareness
Dominican Republic	Zero Hunger	Increase consumption of F&V	To promote empowerment and learning and motivate citizens to know about the right to food	Community and mass media	Children and adolescents		NGO	Inform people about food and nutrition through public awareness
Durango, Mexico	Family orchards	Increase consumption of F&V	To contribute to an accessible and varied diet, promoting a better quality of life through the implementation of family orchards	Community	General: population living in poverty and without food safety	2013	Government	Harness food supply chain and actions across sectors to ensure coherence with health
Ecuador	Reglamento de bares escolares del sistema nacional de educación	Desensitize ultra-processed food and beverages consumption	To regulate school canteens within the national education system		Children	2014	Government	Offer healthy food and set standards in public institutions
El Salvador	5 a Day	Increase consumption of F&V	To promote the consumption of fruits and vegetables	Mass media and community	General		NGO	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Finland	Beverage recommendations for children and adolescents, adults and older people	Healthy diet promotion	To give recommendations for beverages for children and adolescents, adults and older people	NA	General	2008	Government	Inform people about food and nutrition through public awareness
Finland	Child and Family Policy in Finland	Healthy diet promotion	To improve the possibilities of parents to spend time with their children, to make working easier for parents and to encourage fathers to take more advantage of the family leave system	Health service, School	Children and parents	1904	Government and NGOs	Give nutrition advice and counselling in healthcare settings
Finland	Decree 564/2003 on supporting meals at universities	Healthy diet promotion	To provide healthy food in universities	Universities	University students	2013	Government and academia	Offer healthy food and set standards in public institutions
Finland	Early Childhood Education and Care	Education	To ensure the best interest of the child is always the primary consideration. The child has a right to well-being, care and protection, and his/her opinion is considered in decision-making	School	Children	1921	Government	Give nutrition education and skills
Finland	Finish nutrition guidelines	Fruit and vegetable provision	To provide healthy and necessary nutrition that fulfills children's nutritional needs	School	Children	2017	Government	Offer healthy food and set standards in public institutions
Finland	Eat Veg, eat local	Increase consumption of F&V	To increase the consumption of F&V from the current level of 350 g per person to 500 g	Media and community	General	1980	NGO	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Germany	German Nutrition Society guidelines	Healthy diet promotion	To provide nutritional quality standards for school meals	School	Children	2014	Government	Offer healthy food and set standards in public institutions
Germany	DGE's Quality Standard for School Meals	Guidelines	To support those responsible for school meals while implementing adequate and nutritionally balanced meals, which therefore enables the pupils to choose from a wholesome offer of food	School		2014	NGO and government	Inform people about food and nutrition through public awareness
France	Law No. 2004-806, Article 30	Desensitize ultra-processed food and beverage consumption	To reduce consumption of unhealthy food	School	Children	2005	Government	Offer healthy food and set standards in public institutions
France	Decree No. 2011-1227 from Law No. 2010-874	Healthy diet promotion	To regulate the nutritional quality of school meals in France	School	Children	2011	Government	Offer healthy food and set standards in public institutions
France	5 a Day	Increase consumption of F&V	To promote fresh fruit and vegetable consumption through communication and scientifically evidence-based information	Schools,		1981	NGO	Inform people about food and nutrition through public awareness
France	"Eat Move" as part of the National Nutrition and Health Programme (PNNS)	Healthy diet promotion	To provide recommendations to eat better and advice to improve everyone's behaviour according to their age and needs	Mass media	General	2001	Government	Inform people about food and nutrition through public awareness

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Hong Kong	Nutritional Guidelines on Snacks for Students For Use in Primary and Secondary Schools	Healthy diet promotion	To guide the types of food and drink items to be allowed and promoted in the school environment for the benefit of children's health	School	Children	2006	Government	Offer healthy food and set standards in public institutions
Honduras	5 a Day	Increase consumption of F&V	To promote the consumption of a minimum of five servings of fruits and vegetables a day as the basis of a healthy diet	School, community and mass media	General	2016	NGO	Inform people about food and nutrition through public awareness
Guam	Policy in Favour of Healthy Food and Beverage Products in all Vending Machines Located within Government Facilities	Desensitize ultra-processed food and beverages consumption	To promote healthy food and beverages in all vending machines located in government facilities	Workplace	General	2011	Government	Offer healthy food and set standards in public institutions and other specific settings
Global	Global Alliance for the Future of Food		To leverage the resources and networks of an alliance of mostly private foundations to get sustainable food systems on the political, economic, and social agenda.	General	General			Harness food supply chain and actions across sectors to ensure coherence with health
Germany	IN FORM	Education, Healthy diet promotion	To promote healthy diets and physical activity: to foster healthier environments for children to grow up in, to encourage adults to adopt healthier lifestyles and to see society as a whole enjoy a higher quality of life and physical fitness	All	General	2008, 2009 and 2020	NGO and government	Offer healthy food and set standards in public institutions and other specific settings, and Give nutrition advice and counselling in healthcare settings

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Italy	5 colori del benessere	Increase consumption of F&V	To guarantee the quality, provenance and traceability of Italian fruit and vegetables, according to the requirements required by the regulation and by the disciplinary of use.	Point of sales	General		NGO	Inform people about food and nutrition through public awareness
Israel	Lunch-Programme-Healthy Nutrition Regulation	Healthy diet promotion	To regulate the food provided to children attending after-school programmes	School	Children	2017	Government	Offer healthy food and set standards in public institutions
Israel	Healthy School Kiosk	Desensitize ultra-processed food and beverages consumption	To extend the Lunch Programme Healthy Nutrition Regulation to stipulate what foods must be offered in schools	School	Children	2018	Government	Offer healthy food and set standards in public institutions
Iran	Guideline for healthy diet and school buffets	Healthy diet promotion	To provide a guide for healthy diet and school buffets	School	Children	2008	Government	Offer healthy food and set standards in public institutions
Hungary	Nutritional guidelines (set by the National Institute of Pharmacy and Nutrition)	Healthy diet promotion	To address food affordability and provide purchase incentives	School	Children	2012	Government	Offer healthy food and set standards in public institutions
Hungary	FruitVeB	Availability	To encourage fruit and vegetable production in Hungary under the tide "3x3 a day", implementing two objectives at the same time – one related to public health and the other to the national economy	Community	Fruit and vegetable sector	1993	NGO	Inform people about food and nutrition through public awareness

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Jamaica	Nutrient Guidelines	Desensitize ultra-processed food and beverages consumption	To regulate the nutrient profile sold/served within all public educational institutions for children	School	Children	2018	Government	Offer healthy food and set standards in public institutions
Japan	5 a Day	Education	To consistently provide information on health benefits of fruit and vegetable consumption	Point of sales	General	2002	NGO	Inform people about food and nutrition through public awareness
Japan	Japanese Basic Law on Shokuiku	Education and Health promotion	To promote the acquisition of knowledge about food as well as the ability to make appropriate food choices	School	General	2005	Government	Give nutrition education and skills
Jordan	National School Health Strategy	Healthy diet promotion	To regulate which foods may be sold in school canteens	School	Children	2013	Government	Offer healthy food and set standards in public institutions
Kuwait	Food prohibitions in schools	Healthy diet promotion	To reduce the intake of fat and sugar by pupils	School	Children	2019	Government	Offer healthy food and set standards in public institutions
Lithuania	Order V-964	Healthy diet promotion	To establish catering standards for preschools, secondary schools, and children's social care institutions	School	Children	2011	Government	Offer healthy food and set standards in public institutions

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Malaysia	Healthy Cafeteria	Healthy diet promotion	To encourage the promotion of healthier food options in cafeterias	Government health facilities	General	2008	Government	Offer healthy food and set standards in public institutions
Malaysia	Guide for Healthy School Canteen Management	Healthy diet promotion	To improve the food service of school canteens and cultivate a balanced and healthy food intake in schools	School	Children	2012	Government	Offer healthy food and set standards in public institutions
Malaysia	Clinical Practice Guidelines (CPG) on Management of Obesity	Healthy diet promotion	To provide guidelines for all health professionals interested and involved in the diagnosis, management and prevention of obesity in Malaysia	Health service	General	2004	Government and academia	Give nutrition advice and counselling in healthcare settings
Malaysia	Clean, Safe, Healthy Initiative	Healthy diet promotion	To encourage the provision of safe and healthy food.	Food outlets	General	2012	Government	Offer healthy food and set standards in public institutions
Macedonia	Rulebook on nutrition standards and meals for the students living in student dormitories	Healthy diet promotion	To limit the amount of salt, sugar, and fat levels in school meals	School	Children	2014	Government	Offer healthy food and set standards in public institutions
Macedonia	Health is a Choice! Healthy Food and Healthy Lifestyle for a Long Life!	Healthy diet promotion	To raise awareness about the importance of eating healthy food, leading a healthy lifestyle and exercising. The campaign included TV and radio commercials, media advertisements and billboards	Mass media	General	2014-2015	Government	Inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Malaysia	Healthy Menu Provision During Meetings	Guidelines	To provide healthy meeting catering	Government departments	Workers	2010	Government	Offer healthy food and set standards in public institutions
Malaysia	Komuniti Sihat Perkasa Negara (KOSPEN)	Education and Health diet promotion	To address lifestyle risk factors of non-communicable diseases (NCDs). The implementation is based on volunteers (GSIM) from the community to act as an agent to mobilize society towards healthy lifestyles and prevent non-communicable diseases	Community	General	2013	Government	Give nutrition education and skills
Malaysia	Voluntary Healthy Catering Initiative	Healthy diet promotion	To provide training for food outlet and canteen operators on healthy eating, preparing healthy menus, the effects of unhealthy eating habits, and food safety	School and workplace	General	2005	Government, private sector	Give nutrition education and skills
Malta	Healthy Lifestyle	Healthy diet promotion	To give high priority to healthy eating and a healthy lifestyle on school agendas	School	Children	2014	Government	Offer healthy food and set standards in public institutions
Mexico	Beverage consumption for a healthy life	Healthy diet promotion	To give Consumption Recommendations for the Mexican Population	NA	General	2008	Government and academia	Inform people about food and nutrition through public awareness
Mexico	Check, Monitor and Move Yourself	Healthy diet promotion	To foster a culture of taking care of personal health, promote exercise and discourage the consumption of high-calorie food	Mass media	General	2013	Government	Inform people about food and nutrition through public awareness

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New Zealand	5 a Day	Increase consumption of F&V and Education	To encourage all the population to eat five or more servings of colourful, fresh fruit and vegetables every day for health and vitality	Mass media	General	2007	NGO	Inform people about food and nutrition through public awareness
New Caledonia	Eat better, Move more: Mange mieux, Bouge plus	Healthy diet promotion	To improve the diet of families with practical, easy tips for a healthy lifestyle	Mass media	Women	2011	Government	Inform people about food and nutrition through public awareness
Netherlands	Maak je niet dik! "Don't get fat!"	Healthy diet promotion	To raise awareness about the issue of weight-gain prevention and to induce more positive attitudes and the motivation to prevent weight gain	Mass media	Non-obese young adults	2002	Government	Inform people about food and nutrition through public awareness
Nauru / multi-country	Nauru and FAO Partnering t It is provided by the 2013-2017 Country Programming Framework (CPF) for the Pacific Subregion,	Provision	To support local food production to achieve improved health, food security and sustainable agricultural development. FAO interventions include strengthening of capacities in sustainable natural resource management; particularly in the face of climate change	Community	General	2013- 2017	UN-FAO	Harness food supply chain and actions across sectors to ensure coherence with health
Multi-country: Guatemala, Costa Rica	From the Farm to the school	Increase consumption of F&V	To increase fruit consumption and vegetables in schools of Guatemala and San José, Costa Rica, through the implementation of a provision of fruits and vegetables sustained in the school environment, in order to establish habits healthy food at ages early	School	Children	2018	Government	Give nutrition education and skills

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Paraguay	5 a Day	Increase consumption of F&V	To promote the daily consumption of 5 servings of fruits and vegetables in the Paraguayan population	Mass media	General		NGO	Inform people about food and nutrition through public awareness
Norway	Norwegian School Fruit Scheme (NSFS)	Fruit and vegetable provision	To increase child fruit intake	School	Children	2007	Government	Offer healthy food and set standards in public institutions
Norway	5 a Day	Education	To promote a love of good food and highlight food and health among the population to increase the consumption of fruit and vegetables	Schools	General		NGO	Inform people about food and nutrition through public awareness
Nicaragua	5 a Day	Increase consumption of F&V	To promote the consumption of at least 5 servings of fruits and vegetables a day	Schools and community		2010	Government and FAO	Inform people about food and nutrition through public awareness
New Zealand	WorkWell programme	Healthy diet promotion	To help businesses improve their employees' health by supporting the improvement of the working environment and organizational systems	Workplace	Workers	2011	Government	Offer healthy food and set standards in public institutions
New Zealand	School Lunch Programme	Fruit and vegetable provision	To provide a free healthy lunch to children	School	Children	2020	Government	Offer healthy food and set standards in public institutions and other specific settings
New Zealand	Fruit in the Schools	Fruit and vegetable provision	To encourage children to eat more fruit and vegetables and to adopt healthier lifestyles	School	Children	2005	Government	Offer healthy food and set standards in public institutions

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Peru	5 a Day	Increase consumption of F&V	To develop the whole fruit and vegetable industry and realize promotional and informational projects.	Media, schools,	General	2008	NGO and food industry	Inform people about food and nutrition through public awareness
Peru	Community Kitchens (Comedores Populares)	Provision and healthy diet promotion	To provide food to families living in poverty in Peru	Community	General	1978	Government	Give nutrition education and skills
Peru	Healthy Kiosks and School Canteens	Healthy diet promotion	To promote healthy food in school kiosks and canteens	School	Children	2015	Government	Offer healthy food and set standards in public institutions
Peru	Come rico, come sano, come peruano (Eat delicious, eat healthy, eat Peruvian food).	Healthy diet promotion	To improve eating patterns by promoting the high nutritional quality of Peruvian food through recipe books, TV and radio spots and conferences	Mass media	General	2011	Government	Inform people about food and nutrition through public awareness
Peru	5 a Day	Increase consumption of F&V	To develop the whole fruit and vegetable industry and realize promotional and informational projects.	Schools, community	General		NGO	Inform people about food and nutrition through public awareness
Poland	School Food Guidelines	Guidelines	To establish nutrition standards in schools	School	Children	2008	NGO	Offer healthy food and set standards in public institutions
Poland	Law Act on Food and Nutrition Safety	Healthy diet promotion	To promote food and nutrition standards for canteens in pre-schools, primary and secondary schools	School	Children and adolescents	2014	Government	Offer healthy food and set standards in public institutions

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Portugal	5 a Day	Increase consumption of F&V	To promote the daily consumption of at least 5 servings of fruits and vegetables as a way to promote a healthy diet and contribute to the prevention of various diseases associated with poor eating habits	Media	Young people (children from 7 to 9 years) and 2nd cycle (children from 10 to 12 years)		Private sector	Inform people about food and nutrition through public awareness
Romania	Ministerial Order 1563/2008	Healthy diet promotion	To provide a list of foods not recommended for preschool and school children	School	Children and adolescents	2008	Government	Offer healthy food and set standards in public institutions
Singapore	Health Promotion Board – Ministry of Health Clinical Practice Guidelines: Obesity	Healthy diet promotion	To provide health professionals in Singapore with recommendations for evidence-based interventions for obesity	Health service	General	2009	Government	Give nutrition advice and counselling in healthcare settings
Singapore	Healthier Dining Programme	Provision and accessibility, Healthy eating diet	To encourage F&B companies (e.g. restaurants, caterers and food courts) to provide healthier meals for their customers	Workplace	General; Any F&B business registered and operating in Singapore	2011 and 2014	Government	Harness food supply chain and actions across sectors to ensure coherence with health and set incentives and rules to create a healthy retail and food service environment

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South Africa	Community health worker training programmes	Healthy diet promotion	To provide comprehensive outreach health promotion, prevention and screening	Community		2012	Government	Nutrition advice and counselling in healthcare settings
Slovenia	Slovenia's Law on School Nutrition	Dietary guidelines	To enable students to make healthy nutritional choices and develop healthy nutritional habits	School	Children	2010	Government	Offer healthy food and set standards in public institutions
Slovenia	Slovenia education curriculum	Education and Health diet promotion	To help schoolchildren to acquire knowledge about nutrition to help them form healthy nutritional habits	School	Children	2005	Government	Give nutrition education and skills
Singapore	Workplace Nutrition Programme	Education, provision and healthy diet promotion	To promote and sustain healthy dietary practices among employees, thereby reducing the risk of diet-related illnesses	Workplace	Adults		Government	Give nutrition education and skills
Singapore	National Workplace Health Promotion Programme	Healthy diet promotion	To encourage companies to improve the workplace environment by providing tools and grants	Workplace	Workers	2000	Government	Offer healthy food and set standards in public institutions
Singapore	Healthy Meals in Schools Programme	Provision and Healthy diet promotion	To encourage healthier food and beverage choices in schools	School	Children	2011 and 2016	NGO and Government	Offer healthy food and set standards in public institutions and other specific settings and give nutrition education and skills

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South Africa	EduPlant programme	Education and provision	To support the development of school gardens, where children learn to grow fruit and vegetables, eat some of the produce and sell the rest to raise funds. Schools receive support for two years until they can manage on their own	School, community	General: Children, community members, and teachers	1994	Government	Give nutrition education and skills
South Africa	National School Nutrition Programme (NSNP)	Increase consumption of F&V	To provide nutritious meals to children so as to improve their ability to learn. The programmes also teach learners and parents about healthy lifestyles, and promoting development of school vegetable gardens	School	Children	2012	Government	Offer healthy food and set standards in public institutions
South Africa	The curriculum of the Life Orientation	Education and healthy diet promotion	To encourage, along with the development of self-in-society, the development of balanced and confident learners who will contribute to a just and democratic society, a productive economy, and an improved quality of life for all	School	Children	2003	Government	Give nutrition education and skills
South Africa	The South African Integrated Nutrition Programme	Healthy diet promotion and provision	To address malnutrition and guide health workers on health promotion, supplementary feeding for those who are malnourished or at risk of becoming malnourished, rehabilitation of malnourished individuals, and the continuous monitoring and evaluation of the INP	Community and schools	Children under the age of 6, pregnant and lactating women and all people living with chronic diseases	1994	Government	Give nutrition advice and counselling in healthcare settings

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Spain	5 a Day	Increase consumption of F&V	To promote the consumption of fruit and vegetables in the framework of healthy eating through National activities such as 1) the educational programme "5 a Day" and its campaign "5 a Day is vital"; 2) La Frutoteca" to explain the agrifood chain; and 3) during COVID-19 pandemic in Spain the campaign "Now more than ever and always 5 a Day"	Schools and mass media	Children and their families, Spain population	1998 / 1)2004-2012 / 2)2008-2015 / 3)2020	NGO	Inform people about food and nutrition through public awareness
South Korea	School Meals Act	Education and Health diet promotion	To promote nutrition education provided by teachers who are dieticians with a government issued license and have passed a special examination	School	Children and adolescents (elementary, middle, and high schools)	2006	Government	Give nutrition education and skills
South Korea	Safety Management of Children's Dietary Life	Guidelines	To contribute to the promotion of children's health by regulating necessary matters for providing safe and well-balanced nutritional foods to help children develop good eating habits.	School	Children	2010	Government	Offer healthy food and set standards in public institutions
South Africa	Voluntary guidelines for Tuck Shop Operators	Healthy diet promotion	To empower School Management Teams (SMTs) and School Governing Bodies (SGBs) to promote the availability of healthy food alternatives from school tuck shops in school premises. And to ensure that educators promote good nutrition and healthy lifestyles in schools through emphasizing nutrition education and that these guidelines are properly followed by all involved in school (school community members, educators, learners, tuck shop operators)	School	Children	2014	Government	Offer healthy food and set standards in public institutions and other specific settings

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Thailand	Thai School Lunch Programme	Healthy diet promotion	To prevent undernutrition and overweight/obesity	School	Children	1999	Government	Offer healthy food and set standards in public institutions
Thailand	Healthy Menu	Healthy diet promotion	To encourage restaurants and food stores in public hospitals to comply with the Healthy Food Menu Policy	Public hospitals	General	2012	Government	Offer healthy food and set standards in public institutions
Thailand	Ban on soda and sugary snacks	Desensitize ultra-processed food and beverage consumption	To reduce sugar consumption	School	Children	2008	Government	Offer healthy food and set standards in public institutions
Switzerland	5 a Day	Increase consumption of F&V	To promote the consumption of a minimum of 5 servings of fruits and vegetables a day as the basis of a healthy diet	Community	General	2001	Government and NGO	Inform people about food and nutrition through public awareness
Sweden	Good School Meals guidelines	Healthy Diet Promotion	To provide nutritious lunches	School	Children	2007	Government	Offer healthy food and set standards in public institutions
Spain	Fruit in the school (Fruta en el Cole)	Increase consumption of F&V	To provide educational material on Spanish fruits and vegetables, their properties, diet benefits, curiosities and games	School	Children and parents	2009		Give nutrition education and skills
Spain	Law on Nutrition and Food Safety (Ley 17/2011)	Healthy diet promotion	To promote healthy diets	School	Children	2011	Government	Offer healthy food and set standards in public institutions

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UK	British Healthy Start Programme	Cash transfers	To provide pregnant women and/or families with children under the age of four with weekly vouchers to spend on food	Community	Pregnant women and/or families with children under 4 ages	2006	Government	Use economic tools to address food affordability and purchase incentives
UK	5 a Day	Increase consumption of F&V	To encourage people to increase their consumption of fruit and vegetables to at least five portions	Mass media, schools, and points of sale	General	2003	Government	Inform people about food and nutrition through public awareness
Uganda	School Gardening Project Uganda	Education and provision	To promote agriculture as part of the primary school curriculum and extensive vegetable gardening in schools	School, community	General: Children, parents, and teachers	2015	Government and NGO	Give nutrition education and skills
UAE	School Canteen Guidelines for the Emirate of Abu Dhabi	Dietary guidelines	To achieve a safe and integrated food environment for students to protect them from health related risks and guide them to the correct nutritional practices that will benefit them physically and mentally	School	Children	2012	Government	Offer healthy food and set standards in public institutions
Tonga/ multi-country	"Future Farmers of Tonga" programme	Provision	To improve food security and income-earning opportunities through Tonga and FAO Partnering Provided by the 2013-2017 Country Programming Framework (CPF) for the Pacific Sub-region	Community	General	2013- 2017	UN-FAO	Harness food supply chain and actions across sectors to ensure coherence with health
Tonga	Give me five (Mai e Nima)	Increase consumption of F&V	To improve the health and wellbeing of primary school students by educating them about the benefits of eating a variety of fruit and vegetables and as a result, establish life-long healthy eating habits.	School	Children	2012	NGO and Government	Inform people about food and nutrition through public awareness

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UK	Government Buying Standard for Food and Catering Services (GBSF)	Provision and Healthy diet promotion	To ensure healthier food and drink options are available across the public sector. Government departments and their agencies are required to comply with the GBSF, as well as prisons, the armed forces, and the NHS. Schools must follow the school food standards legislation but may also choose to use the GBSF too	Workplace, school, community	General	2014, update March 2015, 2019	Government	Harness food supply chain and actions across sectors to ensure coherence with health
UK - England	School Food Regulations	Dietary guidelines	To restrict food high in fat, salt, and sugar in schools	School	Children	2015	Government + NGOs	Offer healthy food and set standards in public institutions
UK	Eat Them To Defeat Them campaign	Increase consumption of F&V	To change adult and child perceptions of vegetables, and encourage the cooking and eating of vegetables	Media	Children and parents	2019	NGO and media corporates (ITV and Veg Power)	Inform people about food and nutrition through public awareness
UK	Change4life	Healthy diet promotion and Education	To ensure parents have the essential support and tools they need to make healthier choices for their families and increase retail access to fresh fruit and vegetables in deprived, urban areas	Mass media and community	Adults (Parents)	2008 and 2009	NGO and Government	Set incentives and rules to create a healthy retail and food service environment and inform people about food and nutrition through public awareness

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
UK	Peas Please	Availability	To work across the supply chain to get more veg on menus, meals and shopping baskets in order to get everyone in the UK eating more veg. To secure commitments from industry and government to improve the availability, acceptability (including convenience), affordability, and quality of the vegetable offer in shops, schools, fast food restaurants and beyond, and in turn stimulate increased vegetable consumption among the UK public, particularly children and those on a low income.	Community, schools, point of sales	General	Oct-16	NGO	Harness food supply chain and actions across sectors to ensure coherence with health
UK - Northern Ireland	Nutritional Standards for School Lunches and Healthy Food for Healthy Outcomes - Food in Schools Policy	Dietary guidelines	To restrict food high in fat, salt and sugar in schools	School	Children	2013	Government and NGOs	Offer healthy food and set standards in public institutions
UK	National Health Service: weight management referral schemes	Healthy diet promotion	To allow primary care doctors to refer a patient to weight management programmes free of charge	Health service	General	2006	Government	Give nutrition advice and counselling in healthcare settings
UK	National curriculum. General Certificate of Secondary Education (GCSE)	Education, healthy diet promotion	To acquire a proper understanding of the scientific principles behind food and nutrition, and use a number of practical cooking techniques to prepare and cook food	School	Children	2014	Government	Give nutrition education and skills
UK	Healthy Choice Award	Healthy Diet Promotion	To encourage food outlets to prepare, cook and serve healthier meals	Community	All	2008	NGO and government	Set incentives and rules to create a healthy retail and food service environment

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US	Childhood Obesity: Highlights of AMA Expert Committee Recommendations	Healthy diet promotion	To provide recommendations to treat childhood obesity	Health service	Children	2007	Government and academia	Give nutrition advice and counselling in healthcare settings
Uruguay	5 a Day	Increase consumption of F&V	To promote the consumption of a minimum of 5 servings of fruits and vegetables a day as the basis of a healthy diet	Schools, community, point of sales, print media,	General	2007	Government	Inform people about food and nutrition through public awareness
Uruguay	Law No. 19.140 on "healthy eating in schools"	Healthy diet promotion	To protect the health of children and adolescents that attend public and private schools by promoting food with "natural nutritional value" with a "minimum degree of processing" and to limit the intake of free sugars, saturated fat, trans fat, and sodium	School	Children and adolescents	2013	Government	Offer healthy food and set standards in public institutions
UK - Wales	Healthy Eating in Schools	Dietary guidelines	To restrict food high in fat, salt, and sugar in schools	School	Children	2013	Government and NGO	Offer healthy food and set standards in public institutions
UK - Scotland	Nutritional Requirements for Food and Drink in Schools Regulations	Dietary guidelines	To restrict food high in fat, salt, and sugar in schools	School	Children	2009	Government and NGO	Offer healthy food and set standards in public institutions
UK	School Fruit and Vegetable Scheme	Fruit and vegetable provision	To help achieve the 5 a Day recommendation	School	Children	2004	Government	Offer healthy food and set standards in public institutions

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US	Health Bucks	Cash transfers	To provide coupons to buy fresh, locally-grown produce	Community	General	2006	Government	Use economic tools to address food affordability and purchase incentives
US	Have a Plant	Increase consumption of F&V	To tap into the emotional connection that consumers have to the fruit and vegetable eating experience while inspiring long-term, sustainable behaviour change	Mass media	General	2019	NGO, government, and industry	Inform people about food and nutrition through public awareness
US	Good Food, Healthy Hospitals (GFHH)	Healthy diet promotion	To promote healthy food and beverages for patients, staff and visitors in Philadelphia hospitals	Hospitals	General	2014	Government and NGO	Offer healthy food and set standards in public institutions
US	Fresh Fruit and Vegetable Programme	Cash transfers	To encourage students to try new fruits and vegetables as an important tool in the efforts to combat childhood obesity	School	Children	2008	Government	Offer healthy food and set standards in public institutions
US	Food Hero	Increase consumption of F&V	To help low-income Oregonians improve their health by increasing their consumption of fruits and vegetables	Mass media	Low-income Oregonians	2011	Government and academia	Inform people about food and nutrition through public awareness
US	Expanded Nutrition Education Programme nationwide and in US Territories	Education, Healthy diet promotion and provision	To assist resource-limited audiences to acquire the knowledge, attitudes, and skills in food production and preparation in order to encourage behaviour change	School, community	General	1969	Government	Give nutrition education and skills

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US	Smart Snacks in School Programme	Healthy Diet Promotion	To evaluate snacks according to the general nutrition standards	School	Children	2016	Government	Offer healthy food and set standards in public institutions
US	Smart Meal™ Seal programme	Provision and healthy diet promotion	To encourage the availability of healthier menu options in restaurants, and the selection of healthier options by restaurant customers with a goal of improving the eating habits of individuals who frequently dine out.	Point of sale (restaurants)	Catering managers	2007	Government	Give nutrition education and skills
US	Philly Food Bucks	Cash transfers	To provide incentives to recipients to purchase fresh produce	Community	General	2010	Government	Use economic tools to address food affordability and purchase incentives
US	National School Lunch and School Breakfast Programmes	Provision	To provide nutritionally balanced, low-cost free lunches to children each school day	School	Children	2014	Government and NGO	Offer healthy food and set standards in public institutions and other specific settings
US	Healthy Food Financing Initiative (HFFI)	Financing	To attract healthier retail outlets to underserved areas	Community	All	2014	NGO and government	Set incentives and rules to create a healthy retail and food service environment

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US	National Farm to School	Fruit and vegetable provision	To empower children and their families to make informed food choices while strengthening the local economy and contributing to vibrant communities	School	Children and parents	2007	Government and NGOs	Give nutrition education and skills
US	US Healthy, Hunger-Free Kids Act	Provision	To help ensure every American child has access to the nutrition they need to grow into healthy adults. And to help reduce the childhood obesity epidemic and health risks for children	School	Children	2010	Government	Offer healthy food and set standards in public institutions
US	US Healthy Food Banking Wellness Policy	Subsidies	To increase the amount of healthy, nutritious and locally grown food obtained and provided by the Community Action Partnership of San Bernardino County	Community	General	2015	NGO	Inform people about food and nutrition through public awareness
US	The National 5 A Day Programme	Increase consumption of F&V	To increase fruit and vegetable consumption	School, media, retail	General	1986	Government, NGO, Industry	Inform people about food and nutrition through public awareness
US	Special Supplemental Nutritional Assistance Programme for Women, Infants, and Children	Provision	To safeguard the health of low-income pregnant, postpartum, and breastfeeding women, infants, and children up to age 5	Community	Pregnant, postpartum, and breastfeeding women, infants, and children	2009	Government	Set incentives and rules to create a healthy retail and food service environment

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US - Detroit	Detroit Zoning Ordinance	Provision and accessibility	To guide and regulate the appropriate use or development of all land in a manner that will promote and protect the public health, safety, and general welfare. City of Detroit, including land owned by local, county, state, or federal agencies, except where such land is determined to be exempt from local zoning regulations	Community	General	1984	Government	Set incentives and rules to create a healthy retail and food service environment
US - California	Health in All Policies Task Force	Healthy diet promotion, provision	To work collaboratively across agencies, departments, and offices to improve the health of all people by incorporating health, equity, and sustainability considerations into State decision-making, policies, and practices	School, workplace, community	General	2013, 2016	Government	Harness food supply chain and actions across sectors to ensure coherence with health
US - Los Angeles	Choose Health LA Restaurants	Healthy Diet Promotion	To promote healthier meal choices	Restaurants	All	2013	Private sector and government	Set incentives and rules to create a healthy retail and food service environment
US - Los Angeles	The Healthy Food Promotion in Los Angeles County Food Service Contracts motion	Healthy eating promotion and provision	To require county departments to consult with the Department of Public Health prior to releasing any Request for Proposals for food service contracts to ensure that requirements in the contract promote healthy nutrition	Community, retail, workplace	Total population	2011	Government	Harness food supply chain and actions across sectors to ensure coherence with health

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US - Massachusetts	Executive order No. 509: Massachusetts State Agency Food Standards	Provision and healthy diet promotion	To ensure that each state agency purchases and provides food that meets nutrition guidelines established by the Department of Public Health	Health services (childcare services, prison)	General: all state agencies in the Executive Department	2009	Government	Offer healthy food and set standards in public institutions and other specific settings and harness food supply chain and actions across sectors to ensure coherence with health
US - New York	Grow NYC School Gardens	Education and provision	To inspire, promote and facilitate the creation of sustainable gardens in public schools throughout New York City	School, community	Children	2010	Government	Give nutrition education and skills
US - New York	Take me with you	Increase consumption of F&V	To encourage New Yorkers to make healthy choices (fruits and vegetables) for snacks on the go	Public space (press advertising)	General	2014	Government	Inform people about food and nutrition through public awareness
US - New York	Health Programme of New York City (FRESH)	Financing	To promote neighbourhood grocery stores offering fruit and vegetables	Community	All	2009	NGO and Government	Set incentives and rules to create a healthy retail and food service environment
US - New York	Executive Order No. 122 September 19, 2008 Food Policy Coordinator For The City Of New York And City Agency Food Standards	Provision and accessibility and Healthy diet promotion	To promote access to healthy food for all New Yorkers	School, workplace, community	General	19 September, 2008. Updated 2014	Government	Harness food supply chain and actions across sectors to ensure coherence with health

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
US - Wisconsin	Got Dirt? Gardening Initiative	Increase consumption of F&V	To assist with the implementation of school, community, and child care gardens in order to increase fruit and vegetable consumption in Wisconsin	School, community	General	2005	Government and academia	Harness food supply chain and actions across sectors to ensure coherence with health
US - San Francisco	San Francisco's Healthy Vending Machine Policy	Desensitize ultra-processed food and beverages consumption	To promote healthy food and beverage options	All	General	2016	Government	Offer healthy food and set standards in public institutions and other specific settings
US - Philadelphia	City of Philadelphia nutrition standards	Provision and healthy diet promotion	To offer healthy food and set standards in public institutions and other specific settings	Workplace	Staff and other providers who work in city agencies serving, selling, or preparing food.	2014	Government	Give nutrition education and skills
US - New York	New York State Finance Law. Guidelines for Purchasing New York State Food Products	Provision	To encourage both the purchase of New York State Food Products as well as fair and open competition	Community	General	2012	Government	Harness food supply chain and actions across sectors to ensure coherence with health
US - New York	New York City's Food Standards	Guidelines	To provide nutritional standards for all food purchased or served by city agencies	Prisons, hospitals and senior care centres	General	2008	Government	Offer healthy food and set standards in public institutions

COUNTRY / CITY	NAME OF THE INITIATIVE	TYPE OF INTERVENTION	OBJECTIVE	SETTING	TARGET POPULATION	YEAR BEGAN	SECTOR	NOURISHING CATEGORY
Zimbabwe	Urban Agriculture Policy	Provision	To support and promote urban agriculture and utilize it as a strategy to improve the quality of life of its citizens through the provision of adequate and balanced full nutritional foods. The urban agriculture activities will take into consideration public health issues, gender and social inclusion criteria as well as the protection of natural environments	Community	General: particularly vulnerable and underprivileged groups.	2007	Government	Harness food supply chain and actions across sectors to ensure coherence with health
Vietnam	National Nutrition Strategy	Education, healthy diet promotion and provision	To ensure that, by 2020, the average diet of Vietnamese people will be improved in quantity, balanced in quality, hygienic and safe; child malnutrition will be further reduced, especially the prevalence of stunting, contributing to improved nutrition status and stature of Vietnamese people; and obesity/overweight will be managed, contributing to the control of nutrition-related chronic diseases.	School, community, health service	General	2011	Government	Give nutrition education and skills
Venezuela	Agarra dato, come sano (Get informed, eat healthy)	Healthy diet promotion and education	To halve the number of obese people in Venezuela by 2019	Mass media	General	2014	Government	Inform people about food and nutrition through public awareness
Venezuela	5 a Day	Education	To promote the consumption of a minimum of 5 servings of fruits and vegetables a day as the basis of a healthy diet	Schools	General: children, their families, students of higher education	1988	NGO and academia	Inform people about food and nutrition through public awareness
US – Wisconsin	Got veggies?	Increase consumption of F&V	To get children to eat more fresh fruits and vegetables through a garden-based nutrition education curriculum	School, community	Children	2005	Government and academia	Give nutrition education and skills

APPENDIX B: Summary of umbrella review of effectiveness of actions to improve fruit and vegetable intake

INTERVENTION	REVIEW QUALITY*	FINDINGS	EFFECT
School-based interventions			
Providing (for free or at reduced cost) or increasing the availability (e.g. in cafeterias) of F&V	High	<p><u>Fruit:</u> Increased intake by 0.27 servings/day (95%CI: 0.17, 0.36; p=<.00; I2 78.3%; n=15)</p> <p><u>Vegetables:</u> Non-significant increase in intake 0.04 servings/day (95%CI 0.01, 0.08; p=0.22; I2 23.4%; n=11)</p> <p><u>Combined:</u> Increased intake by 0.28 servings/day (95%CI: 0.17, 0.40; p=<.001; I2 90.2%; n=16)</p>	√
Food standard policies	High	<p><u>Fruit:</u> Increased by 0.76 servings/day (95%CI: 0.37, 1.16; p=NR; I2 NR; n=2)</p> <p><u>Vegetable:</u> Non-significant increase in intake of 0.30 servings/day (95%CI: -0.001, 0.59; p=NR; I2 NR; n=2)</p> <p><u>Combined:</u> Non-significant trends toward increased intake of F&V intake of 0.12 servings/day (95%CI: -0.08, 0.31; p=NR; I2 NR; n=5)</p>	√
School gardens	High	"The selected articles demonstrate that children increased F&V daily/weekly intake" (n=20)	√
Circular/ nutrition education	Medium	"Of the 12 studies that adopted at least two of the three most common components (activities in the classroom, parental development and school feeding policy), 10 presented results that confirm the effectiveness of nutritional education interventions in schools for increased consumption of F&V among children and adolescents."	√
School eHealth interventions	High	eHealth school-based multiple health behaviour change interventions led to a small but significant increase in fruit and vegetable intake immediately after the intervention (Standardised mean difference (SMD) = 0.11; 95%CI: 0.03, 0.19; p=0.007; I ² 42% n=7). Effect on F&V intake were not sustained at follow-up (SMD 0.07; 95%CI: -0.01, 0.15; p=0.07; I ² 52% n=6)	?
Health promoting schools approach	High	Nutrition only interventions were effective on average at increasing reported F&V intake among students (SMD 0.15; 95%CI: 0.02, 0.29; p=NR; I2 = 83%; n=9).	√

INTERVENTION	REVIEW QUALITY*	FINDINGS	EFFECT
Childcare-based interventions			
Child feeding interventions delivered by childcare providers	High	Child feeding interventions for childcare providers improved fruit and/or vegetable intake of children: SMD 0.63 (95%CI 0.23, 1.03; p=0.002; I2 81%; n=8)	✓
Parent nutrition education interventions delivered in childcare	High	Parent nutrition education did not significantly improve child fruit and/or vegetable intake: SMD 0.43 (95%CI -0.27, 1.13; p=0.23; I2 84%; n=2)	?
Multicomponent interventions	High	Multi-component interventions delivered in childcare did not significantly improve child fruit and/or vegetable intake: SMD 0.21 (95%CI -0.07, 0.49; p=0.15; I2 78%; n=5)	?
Parent and home-based intervention			
Nutrition education	High	Parent nutrition education interventions delivered at home did not improve child F&V intake: SMD=0.07 (95%CI -0.14, 0.27; p=0.52; I2 68%; n=5)	?
Child feeding interventions	High	Child feeding interventions for parents significantly improved child F&V intake: SMD=0.46 (95%CI: 0.13, 0.79; p=0.007; I2 68%)	✓
Workplace interventions			
Workplace cafeteria interventions	High	“There appears to be a moderately strong association toward a positive impact of cafeteria interventions to increase fruit and/or vegetable consumption. Of the 18 studies in the review, 13 reported a statistically significant increase, one reported a significant decrease, three reported mixed results, and one did not assess a change in consumption.” Six studies assessed long-term follow-up and reported mixed results	✓
Specific programme: Total Worker Health (TWH) programme (target work-related safety, health hazards and prevention)	High	“Three RCTs (all from the same research team) ... measured changes in fruit and vegetable intake among US manufacturing or construction workers who were randomly assigned to a multicomponent integrated intervention or no intervention. Evidence from these three RCTs supported the effectiveness of TWH interventions compared with no intervention for improving fruit and vegetable consumption over 26 to 104 weeks.”	✓

INTERVENTION	REVIEW QUALITY*	FINDINGS	EFFECT
Primary care interventions			
Counselling - individual or group; via in-person, telephone, web-based, text message, and/or print mailing	High	"...Between-group differences in the mean change of fruit and vegetable intake ranged from -0.2 servings/day (favouring the control group) to 2.2 servings/day (favouring the intervention group) at 6 months to 1 year of follow up All six trials that focused dietary messages exclusively on increased fruit and vegetable intake found statistically significantly greater benefit among intervention versus control participants" (n=26)	✓
Community-based individual and group programmes			
After school community-based nutrition education and skill based programmes for children and/or families	Medium	Of the four studies assessing children's vegetable intake, two studies assessed longer-term effectiveness (6 months) on children's vegetable intake. One of two trials of after school programmes were effective in the longer-term (6 months)	?
Cooking lessons/ classes (i.e., school and community based)	Low	"Evidence suggests that cooking classes may positively change intake and preference for vegetables and that the effect might be mediated by tasting new F&V. However, based on the little evidence currently available, no conclusions regarding best practise can be made. Additionally, long-term effects have not been investigated." (n=6)	?
eHealth interventions			
Any eHealth intervention	High	Overall e-Health interventions improved fruit and/or vegetable intake: SMD/Hedge's $g = 0.26$ (SE 0.05; 95%CI 0.17, 0.35; $p < 0.001$; I2 NR; n=19)	✓
Computer-based interventions	High	Computer-based interventions improved fruit and/or vegetable intake: SMD = 0.44 (SE 0.08; 95%CI NR; $p < 0.001$; I2 NR; n=3)	✓
SMS interventions	High	SMS interventions improved fruit and/or vegetable intake: SMD/Hedge's $g = 0.41$ (SE 0.10; 95%CI 0.21, 0.61; $p < 0.01$; I2 NR; n=3)	✓
Internet-based interventions	High	Internet-based interventions improved fruit and/or vegetable intake: SMD/Hedge's $g = 0.19$ (SE 0.05; 95%CI 0.09, 0.29; $p < 0.001$; I2 42; n=9)	✓
CD-ROM, interventions	High	CD-ROM interventions did not significantly improve F&V intake: SMD/Hedge's $g = 0.09$ (SE 0.10; 95%CI NR; $p > .05$; I2 NR; n=2)	?
Mobile apps, interventions	High	Mobile-based (app) interventions did not significantly improve F&V intake: SMD/Hedge's $g = 0.13$ (SE 0.15; 95%CI NR; $p > .05$; I2 NR; n=1)	?
Video game interventions	High	Video game interventions did not significantly improve F&V intake: SMD/Hedge's $g = 0.08$ (SE 0.23; 95%CI NR; $p > .05$; I2 NR; n=1)	?

INTERVENTION	REVIEW QUALITY*	FINDINGS	EFFECT
Mass media campaigns			
Media	Medium	"Several studies suggest potential effectiveness of mass media campaigns as a stand-alone intervention. These have shown temporal improvements in consumption of specific dietary factors, especially increased F&V..." (n=5)	√
Choice architecture			
Choice architecture strategies in school food service, tuck shops and vending machines	Low	"In school settings, choice architecture and nudging have been shown to positively increase selection and overall consumption of fruits and vegetables in the short term. However, evidence for long-term benefits is sparse." (n=7)	?
Choice Architecture/ Nudging	-	"In relation to supermarkets, two of the three included studies observed significant increase in sales of fruit and vegetables." (n=3)	?
New food retail opportunities			
Mobile Produce markets (MPM)	High	Positive associations were observed for all five studies that assessed the relationship between Mobile Produce Markets (MPM) use and fruit and/or vegetable intake. "Overall, intervention studies (n=4) found consistent increases in reported vegetable intake and in combined reported fruit and vegetable intakes during the study periods among MPM users, with greater changes observed in vegetable intake."	√
Farmers markets	Medium	"Two of five studies of new farmers markets reported improvements in F&V intake ranging from -0.70 to +0.70 cups/day and Cohen's <i>d</i> effect sizes ranging from 0.15 to 0.38. " "The remaining three studies report findings graphically or with frequencies, and these suggest improvements in F&V consumption although insufficient data are available to draw a conclusion."	?
Retail supermarkets	Medium	"None of the four retail supermarket studies reported a positive impact on F&V consumption. Two of the studies reported statistically significant inverse findings that suggest the introduction of a new retail supermarket may have decreased F&V consumption, with a third study also reporting an inverse finding that was not statistically significant."	X
Agricultural interventions			
Household food production	Medium	"In general home gardening strategies both with and without animal production improved ... the consumption of vitamin A (VA)-rich fruits and vegetables. Findings for VA-rich foods were consistent regardless of whether the home gardening strategy included an animal production component." (n=5)	√

INTERVENTION	REVIEW QUALITY*	FINDINGS	EFFECT
Food pricing interventions			
Subsidy	High	A 10% price decrease increased consumption of fruits and vegetables by 14% (95%CI: 11% to 17%).	√
Price increase	Medium	<p><u>Low income countries</u></p> <p>-10% increase in the price of F&V = decrease in F&V 7.2% p<.001 -10% increase in the price of meat = increase in F&V 0.05% -10% increase in the price of Fish = decrease in F&V 0.14% -10% increase in the price of Dairy = decrease in F&V 0.01% -10% increase in the price of Cereals = increase in F&V.65% p<.10 -10% increase in the price of Fats and oils = decrease in FV 0.14% -10% increase in the price of sweets = increase in F&V 1.12% p<.001</p> <p><u>Middle income countries</u></p> <p>-10% increase in the price of F&V = decrease in F&V 6.5% p<.001 -10% increase in the price of meat = decrease in F&V 0.26 % -10% increase in the price of Fish = decrease in F&V 0.79% p<0.05 -10% increase in the price of dairy = decrease in F&V 0.58% p<0.05 -10% increase in the price of cereals = increase in F&V 0.07 % -10% increase in the price of fats and oils = decrease in F&V 0.39% -10% increase in the price of sweets = increase in F&V 0.34%</p> <p><u>High income countries</u></p> <p>-10% increase in the price of F&V = decrease in F&V 5.3% p<.001 -10% increase in the price of meat = increase in F&V 0.02% -10% increase in the price of Fish = increase in F&V 0.10% -10% increase in the price of dairy = decrease in F&V 0.30% p<.001 -10% increase in the price of cereals = increase in F&V 0.48% p<.10 -10% increase in the price of fats and oils = decrease in F&V 0.33% -10% increase in the price of sweets = increase in F&V 0.60 p<.001</p>	X

Table notes:

For full review, please see Wolfenden, L., Barnes, C., Lane, C., McCrabb, S., Brown, H.M., Gerritsen, S., Barquera, S., Véejar, L.S., Munguiña, A. & Yoong, S. (2021). "Consolidating Evidence on the Effectiveness of Policies and Programmes Promoting Fruits and Vegetables Consumption: An Umbrella Review."

*Review quality assessed using the 12 criteria critical appraisal tool developed by the Joanna Briggs Institute. Reviews meeting <33% of the criteria were rated as low quality, 34–66% as of medium quality and 67% or more as of high quality.

√ Overall judged as likely to have a positive effect on measures of fruit and/or vegetable intake based on assessment of statistical significance of point estimates in meta-analyses, or summary statements for narrative reviews.

X Overall judged as likely to have a negative impact on measures of fruit and/or vegetable intake based on assessment of statistical significance of point estimates in meta-analyses, or summary statements for narrative reviews.

? Overall the effects of the intervention are uncertain.





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