

# Implementing Healthy Food Environment Policies in New Zealand: Nine Years of Inaction.

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## Research

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1 Title Page

2 Implementing healthy food environment policies in New Zealand: Nine years of inaction.

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## 19 Abstract

20 **Background:** The INFORMAS Healthy Food Environment Policy Index (Food-EPI) was  
21 developed to evaluate the degree of implementation of widely recommended food  
22 environment policies by national governments against international best practice, and has  
23 been applied in New Zealand in 2014, 2017 and 2020. This paper outlines the 2020 Food-EPI  
24 process and compares policy implementation and recommendations with the 2014 and 2017  
25 Food-EPI.

26 **Methods:** In March-April 2020, a national panel of over 50 public health experts participated  
27 in Food-EPI. Experts rated the extent of implementation of 47 ‘good practice’ policy and  
28 infrastructure support indicators compared to international best practice, using an extensive  
29 evidence document verified by government officials. Experts then proposed and prioritised  
30 concrete actions needed to address the critical implementation gaps identified. Progress on  
31 policy implementation and recommendations made over the three Food-EPIs was compared.

32 **Results:** In 2020, 60% of the indicators were rated as having ‘low’ or ‘very little if any’  
33 implementation compared to international benchmarks; less progress than 2017 (47%) and  
34 similar to 2014 (61%). Of the nine priority actions proposed in 2014, there was only  
35 noticeable action on one (Health Star Ratings). The majority of actions were therefore  
36 proposed again in 2017 and 2020. In 2020 the proposed actions were broader, reflecting the  
37 need for multi-sectoral action to improve the food environment, and the need for a mandatory  
38 approach in all policy areas.

39 **Conclusions:** There has been little to no progress in the past three terms of government (nine  
40 years) on the implementation of policies and infrastructure support for healthy food  
41 environments, with implementation overall regressing between 2017 and 2020. The proposed

42 actions in 2020 have reflected a growing movement to locate nutrition within the wider  
43 context of planetary health and with recognition of the social determinants of health and  
44 nutrition, resulting in recommendations that will require the involvement of many  
45 Government entities to overcome the existing policy inertia. The increase in food insecurity  
46 due to Covid-19 lockdowns may provide the impetus to stimulate action on food policies.

## 47 **Keywords**

48 Food environments, government policy, nutrition, accountability, INFORMAS, obesity  
49 prevention

## 50 **Background**

51 New Zealand's food environments are characterised by highly accessible and heavily  
52 promoted energy-dense, often nutrient-poor, food and drinks, that contain high levels of salt,  
53 saturated fats and sugars [1,2]. Food environments are major drivers of unhealthy diets and  
54 energy overconsumption [3–5]. Collectively, unhealthy diets are the greatest contributors to  
55 the preventable health burden in New Zealand. High body mass index (BMI) contributes  
56 8.3% and other dietary risks (such as high salt intake, low fruit and vegetable intake)  
57 contributes 8.6% of disability adjusted life years (DALYs) lost [6]. This is greater than the  
58 estimated 9.7% of health loss from tobacco use [6,7].

59 New Zealand adults have the third highest rate of obesity [8], and children the second highest  
60 prevalence of obesity [9] within OECD and EU countries. In 2018/2019, 31% of adults had  
61 obesity, up from 27% in 2006/07, and one in nine children aged 2–14 years (11%) had  
62 obesity [10]. Adult and child obesity rates were higher for Māori and Pacific and for those  
63 living in areas of high deprivation [10].

64 Effective government policies and actions across settings are essential to increase the  
65 healthiness of food environments and to reduce obesity, diet-related non-communicable  
66 diseases (NCDs), and their related inequities [11]. Internationally, some governments have  
67 demonstrated leadership and taken action to improve the healthiness of food environments.  
68 These can serve as best practice exemplars or benchmarks for other countries. Despite wide  
69 recognition of obesity and diet-related NCDs as a major public health issue internationally,  
70 the New Zealand government has been slow to improve food environments. This is in part  
71 due to the pressure of the food industry on governments [12,13] and other factors, such as the  
72 challenges of providing robust evidence in emerging policy areas and the competition for  
73 resources between prevention efforts and health services delivery [14,15]. Non-cohesive,  
74 diverse requests from public health advocates to address unhealthy food environments are  
75 unhelpful [15] and so an agreed prioritisation of policy demands serves as an effective tool  
76 when lobbying for change.

77 The International Network for Food and Obesity/NCDs Research, Monitoring and Action  
78 Support (INFORMAS) [3] developed a tool and process, The Healthy Food Environment  
79 Policy Index (Food-EPI) [16], to assess the level of implementation of government policies  
80 and infrastructure support compared to international best practice for improving food  
81 environments and population diets. The Food-EPI tool and process have been through several  
82 phases of development, pilot tested in NZ in 2014 [17,18], and since implemented (or in  
83 progress) in 40 low, middle and high income countries. New Zealand is the first country to  
84 implement the tool three times, aligned to political electoral cycles in order to stimulate  
85 debate.

86 This paper presents the results of the third Food-EPI study in New Zealand and compares the  
87 government's progress on policy and infrastructure support for healthy food environments in

88 2020 with 2017 and 2014. We also compare the priority actions recommended by experts in  
89 2020 compared with priorities in 2017 and 2014.

## 90 **Methods**

91 The Food-EPI comprises a ‘policy’ component with seven domains on specific aspects of  
92 food environments and an ‘infrastructure support’ component with six domains to strengthen  
93 obesity and NCD prevention systems. Good practice indicators contained in these domains  
94 encompass policies and infrastructure support necessary to improve the healthiness of food  
95 environments and to help prevent obesity and diet-related NCDs. The overview and  
96 principles of the development of the methods has been previously described [3] and is  
97 summarised in Additional File 1. Food-EPI indicators are consistent with proposed  
98 international policy options [19–21]. Food-EPI aims to create a common understanding  
99 between public health experts to advocate governments on the priorities for policy action.

100 A mixed methods design was used to obtain the ratings of the level of implementation of  
101 good practice policies and infrastructure support, and to identify and prioritise actions to fill  
102 implementation gaps.

### 103 **Expert panel**

104 A wide range of public health experts (academics, researchers and practitioners) and public  
105 health non-governmental organisations (including medical associations, professional bodies  
106 and service providers) were invited to take part in the Food EPI as part of an Expert Panel.  
107 These included participants from the 2014 and 2017 Expert Panels. Government experts (e.g.,  
108 from different Ministries, the Health Promotion Agency and District Health Boards) were  
109 also invited to participate. All participants on the Expert Panel provided informed consent  
110 before taking part in the appraisal. Government experts, acting as observers, were present to

111 provide clarification or additional information but did not participate in the ranking of  
112 actions. This was also the case in 2017, but Government experts were not part of the Expert  
113 Panel in 2014.

#### 114 **International best practice exemplars (benchmarks)**

115 Benchmarks were selected for each of the good practice indicators from the World Cancer  
116 Research Funding NOURISHING framework [21] and obtained from international food  
117 policy experts. Some examples of benchmark policies are the front-of-pack warning labelling  
118 system in Chile, the regulatory norms defining limits for foods high in certain nutrients in  
119 Chile, the UK sugar industry levy on sugar sweetened beverages, the inclusion of a cultural,  
120 ethical and environmental perspectives in the Brazilian dietary guidelines and the nutrient  
121 profiling system used to prevent unhealthy food products carrying health claims in Australia  
122 and New Zealand. The full list of benchmarks is available in Additional File 2.

#### 123 **Evidence compilation and verification**

124 For each Food-EPI (2014, 2017, 2020) an evidence document outlining the current extent of  
125 implementation of all 47 good practice policy and infrastructure support indicators (43 in  
126 2014) across 13 domains was compiled, as outlined previously [17], for the Expert Panel to  
127 carry out their assessment [22]. Information was compiled from policy documents, websites  
128 and budgets retrieved from websites and through Official Information Act requests and  
129 personal communication with government officials. The evidence was comprehensively  
130 documented and returned to government officials to verify its completeness and accuracy.

#### 131 **Rating implementation progress**

132 The Expert Panel rated the level of implementation in New Zealand against each good  
133 practice indicator using the evidence document for reference. This was conducted in February  
134 and March 2020 using an anonymous online survey (Qualtrics) ahead of the workshop. Each

135 expert gave a rating for each indicator on a Likert scale of 1 to 5. A rating of 1 meant the  
136 Expert Panel member believed the New Zealand government had implemented the indicator  
137 between 0 and 20% compared to international best practice and a rating of 5 meant the  
138 indicator had been rated between 80 and 100% compared to best practice. These were  
139 compared to the results of the 2017 and 2014 Food-EPI assessments. The 2017 rating  
140 occurred using an online survey in April and May, while in 2014, two workshops were  
141 convened to obtain ratings. This process was changed after 2014 after receiving evaluative  
142 feedback from the 2014 Expert Panel and learning from other Food EPI processes that had  
143 taken place internationally.

#### 144 **Action and prioritisation workshops**

145 At the workshops, the Expert Panel met to collectively identify the actions required and  
146 prioritise these according to their importance and achievability. In 2020, the implementation  
147 of the workshops was affected by Covid-19 restrictions on travel and social distancing. One  
148 face-to-face workshop was held in Auckland (19 March), and one online workshop was held  
149 via Zoom (8 April) to replace the planned face-to-face workshops in Wellington and the  
150 South Island. At the face-to-face workshop, participants decided if an action was required for  
151 an indicator, then reviewed the 2017 action and decided whether to keep the 2017 action,  
152 revise it, or a develop a new action. Due to restrictions on the time of public health experts  
153 during the Covid-19 pandemic, the actions developed at the Auckland face-to-face workshop  
154 were presented to participants in the online workshop. Participants discussed the high priority  
155 actions verbally or via the chat feature and revised the action or developed a new action. The  
156 action was displayed in the chat feature and a vote was taken to assess if the majority of  
157 experts were in favour.

158 During the workshops, the proposed actions were identified as higher or lower priority.  
159 Following the workshops, the higher-priority actions were ranked by participants from both

160 workshops using an online survey (Qualtrics) sent to all Expert Panel members a week after  
161 the online workshop. Participants were asked to separately prioritise the importance and  
162 achievability of each action, for policies and infrastructure support separately. Importance  
163 was defined as the relative need, impact, effects on equity, and any other positive and  
164 negative effects of the action. Achievability was defined as the relative feasibility,  
165 acceptability, affordability, and efficiency of the action. Participants were asked to consider  
166 ‘acceptability to government’ as pertaining to New Zealand governments in general, not the  
167 government of the day.

168 The results of the 2017 and 2014 Food-EPIs have previously been reported [17,23].

## 169 **Data analysis**

170 The mean rating for each indicator was used to determine an overall percentage level of  
171 implementation. These ratings were then categorised into ‘High’, ‘Medium’, ‘Low’, or ‘Very  
172 little, if any’ levels of implementation based on the following cut-points: >75% = High; 51 to  
173 75% = Medium; 26 to 50% = Low; ≤25% = Very little, if any.

174 For the prioritisation of actions, graphs were created to plot importance against achievability.  
175 In general, actions rated highest for both importance and achievability were selected as top  
176 priorities. A bar graph was created to compare the level of implementation of the indicators  
177 between 2014, 2017 and 2020. The content of the actions prioritised by the Expert Panel was  
178 compared between 2014, 2017 and 2020.

## 179 **Results**

### 180 **Expert Panel**

181 Participation in the 2020 Expert Panel was lower than previous years due to the Covid-19  
182 pandemic, with 27 participants completing the online rating. Ten participants attended the

183 face-to-face workshop. The videoconference workshop was attended by twenty-five  
184 independent participants and four government observers. Thirty-one of the 35 workshop  
185 participants (independent experts) completed the online ranking of actions (89% response  
186 rate). A total of 39 actions were proposed, 22 as higher priority (and subsequently ranked by  
187 experts) and 17 as lower priority. Some actions covered more than one indicator, such as the  
188 proposed action to develop a long-term, multi-sectoral National Food Systems and Nutrition  
189 Strategy.

## 190 **Ratings and progress**

191 Figure 1 presents the level of implementation as rated by the Expert Panel over the three time  
192 points. In 2020, three-fifths (59.5%) of all the indicators were rated as having ‘low’ or ‘very  
193 little, if any’ implementation compared with international benchmarks (49.0% in 2017 and  
194 60.5% in 2014). In 2020, 15% of indicators were rated as high implementation which was  
195 similar to 2014 and 2017 (14%, 15%). In 2020, two-thirds (69.5%) of the policy indicators  
196 and half (50%) of the infrastructure indicators and were rated as ‘low’ or ‘very little, if any’  
197 implementation. This was similar to 2014 (75% policy, 48% infrastructure) and to 2017 for  
198 policy (70%) but different for infrastructure in 2017 which had dipped to a low of 29% of  
199 indicators ranked as low’ or ‘very little, if any’ implementation.

200 Between 2014 and 2020 for the 43 indicators available for each time period, twenty-six  
201 indicators (60%) received the same implementation ranking over all three time periods,  
202 eleven indicators had an increase in level of implementation and six indicators had a lower  
203 rate, with almost all of the progress occurring between 2014 and 2017.

204 New Zealand has rated consistently well against international best practice for six indicators as  
205 indicated in Figure 1. Two related to food labelling indicators in the policy section and four  
206 related to different infrastructure support indicators: transparency in the development of food

207 policies; public access to nutrition information; regular monitoring of NCD risk factors and  
208 health related inequalities.

209 There were twenty indicators for which New Zealand rated consistently poorly against  
210 international best practice (low, very little, if any implementation). Most of these were policy  
211 indicators (14, 70%) including: implementing restrictions on unhealthy food marketing to  
212 children; healthy food policies in schools; fiscal policies to support healthy food choices;  
213 limiting the density of unhealthy food outlets; food composition targets/standards in out of  
214 home settings; and ensuring that trade and investment agreements do not negatively affect  
215 population nutrition and health. The six infrastructure indicators were related to leadership,  
216 evaluation of major programmes, funding for population nutrition promotion and assessing  
217 public impacts of food and non-food policies.

218 The indicators where implementation levels have improved over the period 2012 to 2020  
219 were related to the introduction in 2017 of the Advertising Standards Authority (ASA) self-  
220 regulatory code restricting marketing of unhealthy food and beverages to children; the Health  
221 Star Rating front-of-pack labelling programme in 2014; the introduction of the Healthy Food  
222 and Drink Policy in 2016 for District Health Boards and government agencies; and the  
223 introduction of the Childhood Obesity Action Plan in 2015. However, the ASA self-  
224 regulatory system has been evaluated as ineffective [24] and the Childhood Obesity Action  
225 Plan has not been widely implemented.

226 The indicators where implementation regressed since 2017 were: the regular monitoring of  
227 adult and childhood nutrition status and population intakes; food composition targets for out-  
228 of-home meals; restricting commercial influences on policy development (this regressed as  
229 the Government strengthened engagement platforms with industry, for example industry

230 pledges as part of the Healthy Kids Industry Pledge); and formalising a platform for civil  
231 society participation in improving food environments.

232 *Figure 1: Level of implementation of food environment policies and infrastructure support by*  
233 *the New Zealand Government*

#### 234 **Actions and Priorities**

235 In 2020, of the 39 actions proposed during the workshops (Additional File 2), 8 policy  
236 actions and 14 infrastructure support actions were considered high priority. Some actions  
237 covered more than one indicator. The Expert Panel prioritised thirteen for immediate action  
238 (Figure 2) in terms of feasibility and achievability.

239 *Figure 2: Recommendations from the Expert Panel prioritised for immediate action to*  
240 *improve food environments in 2020*

241 The prioritised actions were compared across 2020 and the previous years (reported in  
242 previous publications [17,23] (Table 1). Some of the actions were almost identical over the  
243 three time periods: restricting marketing to children; food composition targets for sodium and  
244 added sugar; and a sugary drinks levy. The action to ensure that food provided in or sold by  
245 schools and early childhood education services meets dietary guidelines had a similar theme  
246 across years with the addition of the need for a food policy in 2020.

247 *Table 1: Prioritised Recommendations of Expert Panels from 2014, 2017 and 2020 to*  
248 *improve the food environment*

249 A few actions proposed by the Expert Panels changed over time, mostly due to some  
250 implementation of the original proposed action. An action plan/strategy was recommended at  
251 each Food-EPI, starting with an obesity and NCD prevention plan in 2014. The introduction  
252 of a Childhood Obesity Plan in 2015 was reflected in the 2017 recommendation to strengthen

253 this plan. However, this plan was effectively ignored by the next Government. The 2020  
254 action was instead multisectoral in nature, recommending a Food Systems and Nutrition  
255 Strategy. The Government entities with a role in food policy were identified (Table 2). An  
256 action related to the Health Star Rating labelling system was prioritised each year. In 2014,  
257 this was to implement the Health Star Rating, which occurred in 2014, so in 2017 the action  
258 was related to improving the algorithm and mandatory implementation. A review of the  
259 Health Star Rating algorithm took place in 2019 so the 2020 action was related to making the  
260 Health Star Rating mandatory and implementing the review recommendations.

261 *Table 2: Description of Government entities with a role in food policy*

262 Two new actions were introduced in 2017 and one in 2020. In 2017 and 2020 the Expert  
263 Panel recommended actions to implement the Eating and Activity Guidelines introduced in  
264 2015, and to conduct a national nutrition survey (2017, a children’s nutrition survey; 2020 a  
265 children’s and adult nutrition survey). In 2020, the Expert Panel introduced the importance of  
266 ensuring that households have sufficient income as a high priority action, and an action on  
267 conflict of interest procedures when consulting with the food industry.

268 Some actions were proposed but not prioritised in all years, despite the action not being  
269 implemented. In 2014 and 2017, actions related to setting targets to reduce childhood obesity  
270 and population intakes of salt, sugar and saturated fat were prioritised, but were not  
271 considered priority actions in 2020. Increased funding for population nutrition promotion was  
272 recognised as an action for each year, but only prioritised for 2014 and 2017.

## 273 Discussion

274 The 2020 Food-EPI study has assessed the New Zealand government’s progress toward  
275 international best practice in improving food environments and implementing obesity and

276 diet-related NCD prevention policies, and compared this with earlier similar assessments in  
277 2017 and 2014 finding little or regressed progress over this time period.

## 278 **Implementation**

279 The results indicate that overall, almost no progress has been made since the last Food-EPI  
280 assessments in 2017 and 2014, and New Zealand has not increased its performance compared  
281 with international best practice. For those indicators that had changed since the 2017  
282 assessment, the majority had decreased in levels of implementation (six) with only one area  
283 rated as having progressed since 2017.

284 There was some improvement in the level of implementation due to the introduction of some  
285 policies and interventions however experts recommended further actions as implementation  
286 has not been sufficient to improve food environments and population diet.

## 287 **Actions**

288 Reflecting on the changes (or lack of change) over time, the actions proposed in 2014  
289 continued to be high priority in 2017 and 2020. The only action which has seen progress over  
290 time is the Health Star Rating front-of-pack labelling with a five-year review and changes to  
291 the algorithm [25] and even with this, a mandatory programme has not been implemented as  
292 recommended by experts.

293 Compared to earlier years, the 2020 actions have reflected a growing movement to locate  
294 nutrition within the wider context of planetary health with recognition of the social  
295 determinants of health and nutrition, resulting in higher level actions proposed that will  
296 require the involvement of many Government entities. Connecting obesity with climate  
297 change and food security will aid progress for all [26]. The Expert Panel in 2020 was  
298 adamant that there needs to be clear leadership and the development of a multi-sectoral  
299 National Food Systems and Nutrition Strategy guided by a Scientific Committee. This

300 recommendation echoes calls from other experts [27] and groups, such as the Food Systems  
301 Dialogues [28] , Child Poverty Action Group [29] and Eat NZ [30], for an overarching  
302 strategy, prompted by the UK Government announcing the establishment of a National Food  
303 Strategy in 2020 [31].

304 The experts expressed concern about the extent of food insecurity in the country and  
305 widening health inequities, prioritising the policy action of ensuring households receive an  
306 adequate income to enable autonomy to make healthy food choices. One in five children live  
307 in households experiencing moderate to severe food insecurity [32] and concern about this  
308 issue heightened during the Covid-19 crisis [33]. The Child Poverty Reduction Act 2018 [34]  
309 requires monitoring of some of the underlying determinants of health but for substantial  
310 change to occur the Welfare Expert Advisory Group's recommendations require  
311 implementation [35]. The disruption of food environments [36], increase in food insecurity  
312 due to Covid-19 lockdowns [37] and shift towards an unhealthy dietary pattern [38] may  
313 provide the impetus to stimulate action on food policies.

314 Of continued and growing concern among the Food-EPI Expert Panel, along with other  
315 organisations [39,40], was the need for another national nutrition survey. Major policy  
316 decisions are being made in the absence of evidence about the nutrition status and food  
317 consumption patterns of the population. The Covid-19 crisis illustrated the importance of  
318 using epidemiological evidence as a foundation for a public health response; this equally  
319 applies to the chronic crisis of obesity and unhealthy diets.

320 The Expert Panel called for a mandatory approach to be adopted in all policy areas prioritised  
321 in 2020, as current voluntary approaches have proven to be ineffective for marketing of  
322 unhealthy food to children, Health Star Ratings labelling, healthy food policies in schools and  
323 early learning services. Voluntary policies are not enforceable and therefore not implemented

324 or adhered to [41]. Strong government policy is essential to achieve an equitable and  
325 sustainable food system [42]. For example, only 23% of products displayed a Health Star  
326 Rating in 2019 [43] and the School-FERST study found that only 38.5% of primary schools  
327 and 44.8% of secondary schools had a healthy food policy with most assessed to be low in  
328 strength and comprehensiveness [44].

### 329 **Implications**

330 Despite providing the Government with direction on the recommended actions to remedy  
331 areas where New Zealand's performance is falling short through previous Food-EPI, minimal  
332 progress has been made. In the years contributing to the 2014 and 2017 Food-EPI  
333 assessments, New Zealand was governed by a centre-right minority government, who were  
334 replaced in 2017 by a centre-left coalition government. Expectations that a more left-leaning  
335 government would implement policies to improve food environments were not met. Driving  
336 this policy inertia are three main factors: inadequate political leadership and governance to  
337 enact policies; strong opposition to such policies by powerful commercial interests; and a  
338 lack of public demand for policy action [45]. While Food-EPI has stimulated little progress in  
339 New Zealand, without independent Expert Panels measuring the Governments performance  
340 and comparing it over time, there would be little evidence to base calls for policy change and  
341 to measure the degree of policy inertia. Progress on recommended actions has occurred in  
342 other countries where Food-EPI was undertaken, such as the Australian Government's  
343 agreement to the development of a national strategy on obesity [46], a sugar levy introduced  
344 in the United Kingdom [47,48] and legislation in Mexico for front-of-pack warning labels  
345 [49,50].

346 Food-EPI assessed national-level policies and infrastructure action but future assessments  
347 could include local government and District Health Boards as they too play a significant role  
348 by implementing unique food environment policies at the local level of jurisdiction, such as

349 zoning laws for marketing or incentives to food outlets selling healthier foods. In Canada  
350 ‘Local Food-EPI’ have been successfully conducted in three municipal jurisdictions [51–53].  
351 A separate study has benchmarked the commitments of the major food companies in New  
352 Zealand related to population nutrition and obesity prevention [54].

353 The Food-EPI Expert Panel represents a wide range of organisations from academic, public  
354 health units, government policy-makers, non-government organisations and professional  
355 organisations. A particular strength of the study is that the evidence document is verified by  
356 government officials to ensure it is correct and up-to-date. Food-EPI has now been completed  
357 three times in New Zealand and completed (or in progress) in 40 countries globally and is  
358 therefore a tested and accepted tool for monitoring government progress on improving food  
359 environments.

360 A limitation of the 2020 Food-EPI was that it coincided with the Covid-19 pandemic which  
361 meant many public health experts had limited, if any, time to participate. Despite this, the  
362 participating experts were fully engaged and made a valuable contribution. Two changes  
363 made to the workshop proved beneficial and are recommended for future Food-EPI. First,  
364 having the option of a video teleconference enabled more experts to participate. Second,  
365 shifting the prioritisation of selected actions to an online survey after the workshops allowed  
366 time for reflection and was completed by almost all workshop participants. The Food-EPI  
367 tool does not directly capture wider policy action that may address the underlying  
368 determinants of health, such as sufficient income to enable healthy food choices, as this is  
369 broader than the indicators in the food prices domain which related to food subsidies and  
370 taxes rather than income.

## 371 **Conclusions**

372 There has been virtually no progress in New Zealand over the past decade on the  
373 implementation of policies and infrastructure support for healthy food environments, with an  
374 overall regression seen between 2017 and 2020. While there are some areas where New  
375 Zealand is at the level of best practice, almost two-thirds of the Food-EPI indicators show  
376 major implementation gaps still to be addressed. The majority of actions proposed by the  
377 Expert Panel in 2014 were again proposed in 2017 and 2020 due to no progress. However, in  
378 2020 the actions recommended were broader, reflecting a growing movement to locate  
379 nutrition within the wider context of planetary health and with recognition of the social  
380 determinants of health and nutrition. The higher-level actions proposed in 2020 will require  
381 the involvement of many Government entities. It is important that Food-EPI continues to be  
382 conducted every three years to monitor government progress and provide a consensus view  
383 from public health experts on the most important actions required to prevent obesity and  
384 improve diets.

385

### 386 **List of abbreviations**

387 Food-EPI: Healthy Food Environment Policy Index

388 NZ: New Zealand

389 WHO: World Health Organization

390 NCD: Non-communicable disease

391

## 392 **Declarations**

### 393 **Ethics approval and consent to participate**

394 The 2014, 2017 and 2020 studies were approved by the University of Auckland Human  
395 Participants Ethics Committee (references 9326, 018605, 023852 respectively). All Expert  
396 Panellist participants provided written consent prior to the workshop after reading an  
397 information sheet.

### 398 **Consent for publication**

399 Not applicable

### 400 **Availability of data and materials**

401 The datasets used and/or analysed during the current study are available from the  
402 corresponding author on reasonable request.

### 403 **Competing interests**

404 The authors declare that they have no competing interests.

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### 409 **Authors' contributions**

410 SM, SV and BS designed the study. SM, FS and SG collected the data. SM, FS and BS  
411 analysed the data. SM wrote the manuscript with major contributions by all authors. All  
412 authors read and approved the final manuscript

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417 **Additional Files**

418 Additional File 1: Healthy Food Environment Policy Index (Food-EPI)

419 Additional File 2: Recommended actions for the New Zealand government: Policy actions  
420 targeting food environments

421

422 **References**

- 423 1. Mackay S, Ni Mhurchu C, Swinburn B, Eyles H, Young L, Gontijo de Castro T. State  
424 of the Food Supply: New Zealand 2019. University of Auckland 2019.
- 425 2. Eyles H, Jiang Y, Blakely T, Neal B, Crowley J, Cleghorn C, et al. Five year trends in  
426 the serve size, energy, and sodium contents of New Zealand fast foods: 2012 to 2016.  
427 *Nutr J.* 2018;17(65).
- 428 3. Swinburn B, Sacks G, Vandevijvere S, Kumanyika S, Lobstein T, Neal B, et al.  
429 INFORMAS (International Network for Food and Obesity/non-communicable diseases  
430 Research, Monitoring and Action Support): overview and key principles. *Obes Rev.*  
431 2013;14 Suppl 1:1–12. <http://www.ncbi.nlm.nih.gov/pubmed/24074206>
- 432 4. Swinburn B, Sacks G, Hall K, McPherson K, Finegood D, Moodie M, et al. The global  
433 obesity pandemic: shaped by global drivers and local environments. *Lancet.*  
434 2011;378(9793):804–14.
- 435 5. Vandevijvere S, Chow C, Hall K, Umali E, Swinburn B. Increased food energy supply

- 436 as a major driver of the obesity epidemic: a global analysis. Bull World Heal Organ.  
437 2015;93(7):446–56.
- 438 6. Institute for Health Metrics and Evaluation. Global Burden of Disease: New Zealand.  
439 2017. Available from: <http://www.healthdata.org/new-zealand>
- 440 7. Ministry of Health. Longer, healthier lives: New Zealand's health 1990-2017.  
441 Wellington; 2020.
- 442 8. OECD. Obesity Update 2017. 2017. <https://www.oecd.org/health/obesity-update.htm>.  
443 Accessed 17 May 2020.
- 444 9. UNICEF. The State of the World's Children 2019. Children, Food and Nutrition:  
445 Growing well in a changing world. New York; 2019.
- 446 10. Ministry of Health New Zealand. Annual Update of Key Results 2018/19: New  
447 Zealand Health Survey. 2019 [https://www.health.govt.nz/publication/annual-update-](https://www.health.govt.nz/publication/annual-update-key-results-2018-19-new-zealand-health-survey)  
448 [key-results-2018-19-new-zealand-health-survey](https://www.health.govt.nz/publication/annual-update-key-results-2018-19-new-zealand-health-survey). Accessed 20 Mar 2020.
- 449 11. Hawkes C, Jewel J, Allen K. A food policy package for healthy diets and the  
450 prevention of obesity and diet-related non-communicable diseases: the NOURISHING  
451 framework. Bull World Heal Organ. 2015;93(7):446–56.
- 452 12. Stuckler D, Nestle M. Big food, food systems, and global health. PLoS Med.  
453 2012;9:e1001242.
- 454 13. Moodie R, Stuckler D, Monteiro C, Sheron N, Thamarangsi T, Lincoln P, et al. Profits  
455 and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-processed  
456 food and drink industries. Lancet. 2013;381:670–9.
- 457 14. International Association for the Study of obesity. The prevention of obesity and

- 458 NCDs: challenges and opportunities for governments. IASO policy briefing. 2014.  
459 [http://www.iaso.org/site\\_media/uploads/iaso\\_preventingobesitybriefing.pdf](http://www.iaso.org/site_media/uploads/iaso_preventingobesitybriefing.pdf)
- 460 15. Baker P, Gill T, Friel S, Carey G, Kay A. Generating political priority for regulatory  
461 interventions targeting obesity prevention: an Australian case study. *Soc Sci Med*.  
462 2017 Mar;177:141–9. <https://linkinghub.elsevier.com/retrieve/pii/S0277953617300540>
- 463 16. Swinburn B, Vandevijvere S, Kraak V, Sacks G, Snowdon W, Hawkes C, et al.  
464 Monitoring and benchmarking government policies and actions to improve the  
465 healthiness of food environments: a proposed Government Healthy Food Environment  
466 Policy Index. *Obes Rev*. 2013;14 Suppl 1:24–37.  
467 <http://www.ncbi.nlm.nih.gov/pubmed/24074208>
- 468 17. Vandevijvere S, Dominick C, Devi A, Swinburn B. The healthy food environment  
469 policy index: findings of an expert panel in New Zealand. *Bull World Heal Organ*.  
470 2015;93(5):294–302.
- 471 18. Vandevijvere S, Swinburn B. Pilot test of the Healthy Food Environment Policy Index  
472 (Food-EPI) to increase government actions for creating healthy food environments.  
473 *BMJ Open*. 2015;5(1):e006194.
- 474 19. World Health Organization. Global Action Plan for the Prevention and Control of  
475 Non-Communicable Diseases 2013-2020 . 2013. [www.who.int](http://www.who.int). Accessed 16 Jan  
476 2020.
- 477 20. World Health Organization. Consideration of the evidence on childhood obesity for  
478 the Commission on Ending Childhood Obesity: report of the ad hoc working group on  
479 science and evidence for ending childhood obesity. Geneva; 2016.
- 480 21. World Cancer Research Fund. WCRF International Food Policy Framework for

- 481 Healthy Diets: NOURISHING. Available from:  
482 [http://www.wcrf.org/policy\\_public\\_affairs/nourishing\\_framework/](http://www.wcrf.org/policy_public_affairs/nourishing_framework/)
- 483 22. Brownie E, Sing F, Gerritsen S, Mackay S. Evidence document: Benchmarking NZ  
484 Food environment policies against international best practice. Evidence summary for  
485 expert panel 2017-2019. University of Auckland; 2020.
- 486 23. Vandevijvere S, Mackay S, Swinburn B. Measuring and stimulating progress on  
487 implementing widely recommended food environment policies: The New Zealand case  
488 study. *Heal Res Policy Syst.* 2018;16(3).
- 489 24. Sing F, Mackay S, Culpin A, Hughes S, Swinburn BA. Food advertising to children in  
490 New Zealand: A critical review of the performance of a self-regulatory complaints  
491 system using a public health law framework. *Nutrients.* 2020;12(1278).
- 492 25. Australia and New Zealand Ministerial Forum on Food Regulation. The Australia and  
493 New Zealand Ministerial Forum on Food Regulation response to the Health Star  
494 Rating System five year review. 2019.  
495 <https://foodregulation.gov.au/internet/fr/publishing.nsf/Content/hsr-five-year-review>.  
496 Accessed 17 May 2020.
- 497 26. Swinburn BA, Kraak VI, Allender S, Atkins VJ, Baker PI, Bogard JR, et al. The  
498 Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet  
499 Commission report. *Lancet.* 2019;1–56. [http://dx.doi.org/10.1016/S0140-](http://dx.doi.org/10.1016/S0140-6736(18)32822-8)  
500 [6736\(18\)32822-8](http://dx.doi.org/10.1016/S0140-6736(18)32822-8)
- 501 27. Rush E, Obolonkin V. Food exports and imports of New Zealand in relation to the  
502 food-based dietary guidelines. *Eur J Clin Nutr.* 2020 Feb 10;74(2):307–13.  
503 <http://www.nature.com/articles/s41430-019-0557-z>

- 504 28. Food Systems Dialogues. Aotearoa Food Systems Dialogues, Summary report. 2020.  
505 <https://foodsystemsdialogues.org>. Accessed 31 Aug 2020.
- 506 29. Child Poverty Action Group. Aotearoa, land of the long wide bare cupboard: Food  
507 insecurity in New Zealand. 2019. [https://www.cpag.org.nz/campaigns/the-latest-](https://www.cpag.org.nz/campaigns/the-latest-aotearoa-land-of-the-long-wide/)  
508 [aotearoa-land-of-the-long-wide/](https://www.cpag.org.nz/campaigns/the-latest-aotearoa-land-of-the-long-wide/). Accessed 7 Aug 2020.
- 509 30. EAT New Zealand. National Food Strategy. 2020  
510 <https://www.eatnewzealand.nz/national-food-strategy>. Accessed 7 Aug 2020.
- 511 31. National Food Strategy. National Food Strategy: Part One. 2020.  
512 <https://www.nationalfoodstrategy.org/>. Accessed 7 Aug 2020.
- 513 32. Ministry of Health. Household Food Insecurity among Children: New Zealand Health  
514 Survey. Wellington; 2019. [https://www.health.govt.nz/publication/household-food-](https://www.health.govt.nz/publication/household-food-insecurity-among-children-new-zealand-health-survey)  
515 [insecurity-among-children-new-zealand-health-survey](https://www.health.govt.nz/publication/household-food-insecurity-among-children-new-zealand-health-survey)
- 516 33. Child Poverty Action Group. Aotearoa, land of the long wide bare cupboard. Part 6:  
517 Food insecurity in New Zealand. 2020. <https://www.cpag.org.nz/assets/12062020>  
518 [CPAG Food Insecurity VI - FINAL.pdf](https://www.cpag.org.nz/assets/12062020)
- 519 34. Child Poverty Reduction Act 2018. 2018 No 57 New Zealand; 2018.
- 520 35. Welfare Expert Advisor Group. Whakamana Tāngata: Restoring dignity to social  
521 security in New Zealand. 2019. <http://www.weag.govt.nz/weag-report/>
- 522 36. United Nations System Standing Committee on Nutrition. Food environments in the  
523 COVID-19 Pandemic. <https://www.unscn.org/19?idnews=2040>. Accessed 27 Nov  
524 2020.
- 525 37. Ministry of Social Development. Food secure communities FAQs. 2020

- 526 <https://www.msd.govt.nz/what-we-can-do/community/food-secure->  
527 [communities/faqs.html](https://www.msd.govt.nz/what-we-can-do/community/food-secure-communities/faqs.html). Accessed 27 Nov 2020.
- 528 38. Gerritsen S, Egli V, Roy R, Haszard J, Backer C De, Teunissen L, et al. Seven weeks  
529 of home-cooked meals: changes to New Zealanders' grocery shopping, cooking and  
530 eating during the COVID-19 lockdown. *J Roy Soc NZ*. 2020 Nov 16;1–19.  
531 <https://www.tandfonline.com/doi/full/10.1080/03036758.2020.1841010>
- 532 39. Healthier Lives. Call for updated national nutrition survey to see what New Zealanders  
533 are eating. 2019. [https://healthierlives.co.nz/2019/02/08/call-for-updated-national-](https://healthierlives.co.nz/2019/02/08/call-for-updated-national-survey/)  
534 [survey/](https://healthierlives.co.nz/2019/02/08/call-for-updated-national-survey/). Accessed 10 Nov 2020.
- 535 40. Activity & Nutrition Aotearoa. Kawea ake te wero: Enabling everyone in Aotearoa to  
536 eat well. 2020.
- 537 41. Swinburn B, Kraak V, Rutter H, Vandevijvere S, Lobstein T, Sacks G, et al.  
538 Strengthening of accountability systems to create healthy food environments and  
539 reduce global obesity. *Lancet*. 2015 Jun;385(9986):2534–45.  
540 <https://linkinghub.elsevier.com/retrieve/pii/S0140673614617475>
- 541 42. Mozaffarian D, Angell SY, Lang T, Rivera JA. Role of government policy in  
542 nutrition—barriers to and opportunities for healthier eating. *BMJ*. 2018 Jun 13;k2426.  
543 <http://www.bmj.com/lookup/doi/10.1136/bmj.k2426>
- 544 43. Bablani L, Ni Mhurchu C, Neal B, Skeels CL, Staub KE, Blakely T. The impact of  
545 voluntary front-of-pack nutrition labelling on packaged food reformulation: A  
546 difference-in-differences analysis of the Australasian Health Star Rating scheme..  
547 *PLOS Med*. 2020;17(11):e1003427. <https://dx.plos.org/10.1371/journal.pmed.1003427>
- 548 44. Vandevijvere S, Mackay S, D'Souza E, Swinburn B. How healthy are New Zealanders

- 549 food environments? University of Auckland. New Zealand. 2018.
- 550 45. Popkin B, Monteiro C, Swinburn B. Overview: Bellagio Conference on Program and  
551 Policy Options for Preventing Obesity in the Low- and Middle-Income Countries.  
552 *Obes Rev.* 2013 Nov;14:1–8.
- 553 46. Sacks G for the Food-EPI Australia Project Team. Policies for tackling obesity and  
554 creating healthier food environments 2019 progress update Australian governments.  
555 Melbourne; 2019. <https://www.foodpolicyindex.org.au/>
- 556 47. UK Government. Soft Drinks Industry Levy: detailed informaiton. 2020  
557 [https://www.gov.uk/guidance/check-if-your-drink-is-liable-for-the-soft-drinks-](https://www.gov.uk/guidance/check-if-your-drink-is-liable-for-the-soft-drinks-industry-levy)  
558 [industry-levy](https://www.gov.uk/guidance/check-if-your-drink-is-liable-for-the-soft-drinks-industry-levy). Accessed 10 Nov 2020.
- 559 48. The Food Foundation. Food Environment Policy Index (Food-Epi) for England. UK;  
560 2016.
- 561 49. White M, Barquera S. Mexico Adopts Food Warning Labels, Why Now? *Heal Syst*  
562 *Reform.* 2020;6(1):e1752063.  
563 <https://www.tandfonline.com/doi/full/10.1080/23288604.2020.1752063>
- 564 50. Nieto C, Rodríguez E, Sánchez-Bazán K, Tolentino-Mayo L, Carriedo-Lutzenkirchen  
565 A, Vandevijvere S, et al. The INFORMAS healthy food environment policy index in  
566 Mexico: An assessment of implementation gaps and priority recommendations. *Obes*  
567 *Rev.* 2019;20(S2):67–77. <https://onlinelibrary.wiley.com/doi/full/10.1111/obr.12814>
- 568 51. Karbasy K, Vanderlee L, L'Abbé M. Supporting healthier food environments in the  
569 City of Greater Sudbury: Current policies and actions. Toronto, Canada; 2019.  
570 <http://labbellab.utoronto.ca/projects/local-food-epi-2019/>

- 571 52. Karbasy K, Vanderlee L, L'Abbé M. Supporting healthier food environments in the  
572 Region of Peel: Current Policies and priority actions. Toronto, Canada; 2019.  
573 <http://labbelab.utoronto.ca/projects/local-food-epi-2019/>
- 574 53. Karbasy, K., Vanderlee, L. & L. Supporting healthier food environments in the City of  
575 Toronto: Current policies and priority actions. Toronto, Canada; 2019.  
576 <http://labbelab.utoronto.ca/projects/local-food-epi-2019/>
- 577 54. Kasture A, Vandevijvere S, Robinson E, Sacks G, Swinburn B. Benchmarking the  
578 commitments related to population nutrition and obesity prevention of major food  
579 companies in New Zealand. *Int J Public Heal.* 2019;64:1147–57.

580

581 **Table 2: Description of Government entities with a role in food policy**

<b>Government departments</b>	<b>Descriptions</b>
Ministry of Health	Main policy-making department on diet-related health; nutrition-related health inequalities, planning and funding public health and monitoring the performance of District Health Boards.
Ministry for Primary Industries	Main policy making department for New Zealand's primary industries, including food. Functions include providing national direction on ensuring the food produced is safe, enabling international market access for New Zealand's primary products, and representing the interests of the New Zealand primary sector in international trade policy and standard-setting forums.
Ministry of Foreign Affairs and Trade	Main policy-making department on international food trade, overseas aid (including food aid), overseas agriculture, and the Sustainable Development Goals.
Health Promotion Agency	Main communications agency to promote health, including healthy diets
Ministry for the Environment	Main policy-making department on environmental policy and provides national direction on urban (e.g. food density zoning laws) and rural planning (e.g. land use consents) through National Policy Statements and National Environment Standards. Also focuses on climate change, fresh water, marine, land, waste, soil, air, water, sea quality.

Ministries of Business, Innovation and Employment	Main policy-making department managing food and beverage industry investment, consumer protection, immigration (including migrant workers for food supply chain), business, industrial strategy, employment, energy, science, research and innovation (all with food relevance).
Food Standards Australia New Zealand	Develops and administers joint Australia and New Zealand food standards; explains food issues e.g., labelling, additives, chemicals; consults with the community about food safety issues; helps food businesses understand the Food Standards Code.
Ministry of Education	Main policy-making department on education, skills and curriculum, with role as food educator and food provider.
Office of the Prime Minister's Chief Science Advisor	Provides strategic advice across sectors and serves as an accessible conduit between the science community and government.
Local Government	Ensures public services are responsive to the social, economic, environmental and cultural well-being needs of their communities with a particular role in zoning law, district or regional planning and community food supply initiatives for example.
District Health Boards	A role to improve, promote and protect the health of people and communities, including planning and delivering services in their area.
The Treasury	Overall control of government spending.
Department of Prime Minister and Cabinet	Overall policy oversight and coordination. Contains the Child Wellbeing and Poverty Reduction Group.
Te Puni Kokiri - Ministry of Māori Development	Input into major food policies as they relate to Māori.
Ministry for Pacific Peoples	Input into major food policies as they relate to Pacific People.
Ministry of Social Development	Main policy-making department on welfare and pensions, supporting people and whānau in food poverty.
<b>Supporting Government Entities</b>	
Health Research Council of New Zealand	Sets priorities for research and funds research including on food and nutrition.
Broadcasting Standards Authority	Decides complaints about broadcasters; publish and research broadcasting standards.
Sport NZ	Oversees sports sponsorship.
Commerce Commission	Enforce laws that promote competition and protect consumers in New Zealand.
National Ethics Advisory Committee	Provides ethical advice on issues of national significance in respect of health and disability, including characteristics of a fair food system delivering nutritional outcomes.

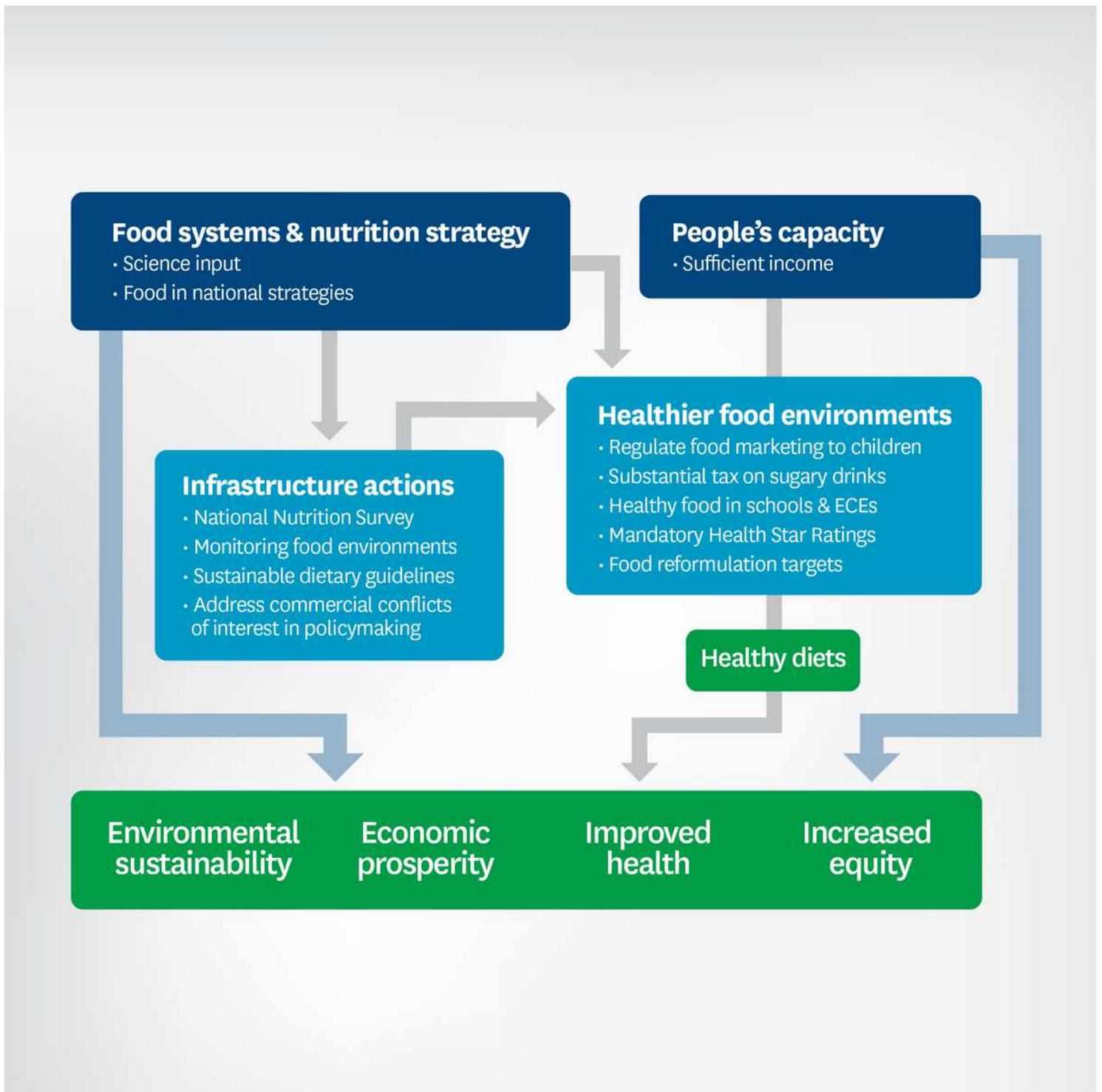
Crown Research Institutes	<p>AgResearch: pastoral, agri-food and agri-technology sector.</p> <p>Plant and Food Research: horticultural, arable, seafood and food and beverage industries.</p> <p>Institute of Environmental Science Research: safeguard people's health, protect the food-based economy, improve the safety of water resources.</p>
Health and Disability Commissioner	Works with clinicians, providers and consumers to improve health services including dietary advice and interventions.
The Office of the Children's Commissioner	Advocates for the interests of young people, ensuring the voices of children are heard in policy making.
Ministry for Culture and Heritage	Funds Broadcasting Standards Authority, NZ on Air and Sport NZ.
Ministry of Transport	Main policy-making department on transport, with role in supporting infrastructure for food distribution and public transport (including for food workers and customers).
Department of Corrections	Main department with role as food provider to prisons.
Department of Internal Affairs	Conduit for Local and Central Government.
State Services Commission	Sets standards for public servants and policy making, including the management of conflicts of interest for food policies.
New Zealand Customs Service	Provides border control and protects the community from potential risks related to food arising from international trade and travel, as well as collecting duties and taxes on imports to the country.
Ministry of Housing and Urban Development	Main policy-making department on housing, built environment and urban development.

# Figures



Figure 1

Level of implementation of food environment policies and infrastructure support by the New Zealand Government



**Figure 2**

Recommendations from the Expert Panel prioritised for immediate action to improve food environments in 2020

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- Table1.pdf
- AdditionalFile1.pptx
- AdditionalFile2.pdf