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Abstract

Obesity remains a major public health challenge across OECD countries and policy-makers globally require successful policy precedents. This paper analyzes New York City's innovative experiences in regulatory approaches to nutrition. We combined a systematic documentary review and key informant interviews (*n* = 9) with individuals directly involved in nutrition policy development and decision-making. Thematic analysis was guided by Kingdon's three-streams-model and the International Obesity Task Force's evidence-based decision-making framework. Our findings indicate that decisive mayoral leadership spearheaded initial agenda-change and built executive capacity to support evidence-driven policy. Policy-makers in the executive branch recognized the dearth of evidence for concrete policy interventions, and made contributing to the evidence base an explicit goal. Their approach preferred decision-making through executive action and rules passed by the Board of Health that successfully banned trans-fats from food outlets, set institutional food standards, introduced menu labeling requirements for chain restaurants, and improved access to healthy foods for disadvantaged populations. Although the Health Department collaborated with the legislature on legal and programmatic food access measures, there was limited engagement with elected representatives and the community on regulatory obesity prevention. Our analysis suggests that this hurt the administration's ability to successfully communicate the public health messages motivating these contentious proposals; contributing to unexpected opposition from food access and minority advocates, and fueling charges of executive overreach. Overall, NYC presents a case of expert-driven policy change, underpinned by evidence-based environmental approaches. The city's experience demonstrates that there is scope to redefine municipal responsibilities for public health and that incremental change and contentious public discussion can impact social norms around nutrition.

Keywords

regulatory, experiences, city's, york, implications, policy:, food, health, municipal, nutrition, prevention, population, obesity, targeting

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Lessons from New York City's experiences in targeting population-level nutritional intake: a case study in regulatory obesity prevention policy

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1. Introduction

During Michael Bloomberg's 12 year tenure as mayor, his administration actively promoted New York City (NYC) as a trailblazer of international significance in chronic disease prevention.[1,2] Publications by successive City Health Commissioners and Department of Health (DOHMH) staff have appeared in the media and academic journals, outlining city policy choices aimed at improving population nutrition and advocating for complementary interventions at higher jurisdictional levels.[e.g.3-9] Some regulatory proposals have been subjected to lawsuits[10-12] or rejected at higher jurisdictional levels.[13,14] Others have been replicated elsewhere: for example, calorie posting imposed on chain restaurants has been brought to federal level in slightly modified form.[15] Descriptive accounts and early evaluations of new rules directly connected to obesity prevention or to healthy food access more generally have been published by public agencies and academics.[e.g.16-24] However, the broad NYC experience as an unprecedented policy effort has gone largely unexamined. In this paper, we provide an in-depth analysis of policy-making in obesity prevention during the Bloomberg mayoralty. Our findings, while specific to New York City, can inform political discussions and guide other jurisdictions on the feasibility and acceptability of different regulatory options.

2. Methods

2.1. Conceptual framework

We have used two complementary frameworks to underpin project development and analysis of the findings. Firstly, we draw on Kingdon's multiple-stream-model[25] which offers a generic,

26 process-oriented representation of the macro-forces and key actors that shape policy-making.
27 Kingdon focuses on agenda-setting, i.e. the process preceding legislative or executive decision-
28 making. He conceptualizes successful policy-making as the result of a brief coupling of
29 otherwise largely independent streams of problem identification, policy solution, and politics. A
30 focusing event, electoral change, or a rapid shift in public opinion open up a limited window of
31 opportunity seized by "policy entrepreneurs". [25] These individuals "hook solutions to problems,
32 proposals to political momentum, and political events to policy solutions."[25, p. 182] Kingdon argues
33 that processes within the policy and politics streams differ: thematic agenda-setting occurs
34 suddenly in the political stream, whereas the definition of potential solutions that may eventually
35 become statutory provisions proceeds incrementally in the policy stream.[25] Similarly, in the
36 expert-driven policy stream, consensus is achieved through "processes of persuasion and
37 diffusion [in which] ideas survive scrutiny according to a set of criteria",[25, p.159] whereas political
38 agreement is reached by bargaining around varied interests.[23] Assuming that solutions are
39 flexible and pre-date political opportunity, he suggests that the entrepreneurs "try to make
40 linkages far before windows open so they can bring a prepackaged combination of solution,
41 problem, and political momentum to the window when it does open."[25, p.183]

42 Secondly, we draw on Swinburn and colleagues' evidence-based decision-making
43 framework, developed on behalf of the International Obesity Task Force (IOTF).[26] It
44 complements Kingdon's focus on parallel processes with a modelling of policy-making as a
45 sequence of actions. The framework identifies five consecutive key actions for successful
46 development and implementation of policy interventions to address obesity: (1) making a case
47 for policy action, (2) identifying causes and contributors and corresponding intervention levers,
48 (3) defining possible interventions and their respective contexts, (4) prospectively evaluating
49 potential measures, and (5) developing a comprehensive policy program combining
50 complementary interventions.[26] Together, these two conceptual models provide a comprehensive
51 explanatory framework for the processes and components of policy-making.

We used a case study methodology which is well suited to "retain the holistic and meaningful characteristics of real-life events",[27, p.4] while using a wide range of evidence.[27] The two-stage data collection process comprised a document review and key informant interviews. The choice of NYC as our case study and the subsequent selection of interviewees followed a non-probability, purposive sampling approach.[28] NYC was chosen in accordance with extreme case sampling,[28] as the city has been exceptional compared to other OECD jurisdictions in terms of the timing, content and reach of the regulatory measures considered and implemented. In addition, NYC has an exceptionally large and diverse population estimated at more than 8,400,000 as of July 2013, more than twice the population of the next biggest US City.[29] The city's size is matched by extraordinary local administrative resources.[6] Additionally, the much larger metropolitan area[30] has been ranked as the fifth most racially and ethnically diverse metro area in the country.[31] New York City itself is also more socioeconomically unequal than the United States at large, with a significantly higher per capita income, but a higher share of persons living below poverty level.[29,32] Following the logic of stakeholder sampling,[28] internal study validity is constructed by identifying a maximally complete set of relevant stakeholders. In the absence of probability sampling, external validity in case study research is achieved not through sample size and valid inferences about the underlying population, but through qualitative analysis leading to potentially generalizable theoretical propositions.[27]

The goal of this study is to deliver an in-depth analysis of the policy-making processes around NYC's dietary obesity prevention efforts and the various factors that shaped their content. We have concentrated on accounts from policy-makers, notably civil servants and appointed and elected leaders. These stakeholders possess knowledge of all stages of the policy-making process. We have not included the views of the food industry as the foremost representatives of private interests. These have been widely analyzed and found to be largely uniform and predictable in response to government interventions targeting population nutrition[e.g.33-64] and considerable attention has focused on the inherent conflicts of interest these stakeholders hold.[35-

[39] Our approach was to explore the influence of the food industry on the policy process through the documentary review and policy-makers' accounts.

2.2. Data collection and analysis

The document review encompassed relevant research articles and policy documents from 2002, when Mayor Bloomberg took office, to August 2014. As summarized in figure 1, we conducted systematic searches of PubMed, the New York Academy of Medicine's grey literature repository GreyLit, and the DOHMH website for research articles, reports, and policy documents pertaining to NYC-specific regulatory obesity prevention efforts. Review data informed the development of the key informant interview schedule and complemented evidence emerging from interviews. <figure 1 here>

Potential participants were selected based on their professional role. We established an initial list of possible interviewees based on authorship of and/or mention in policy documents and research articles identified during the document review. We then used snowball sampling to recruit additional participants by asking interviewees to recommend colleagues they considered important informants based on level of involvement in relevant policy-making processes. Sixteen interview requests were submitted, with nine requests granted. Prior to interview, all participants were informed about project aims and confidentiality arrangements and provided written consent. Of the seven individuals approached who did not participate, two declined and five did not respond to multiple direct contact attempts. Seven face-to-face interviews of 50-70 minutes in length took place in the United States between September and November 2014. Two shorter interviews were conducted by e-mail in November and December 2014. Ethics approval was obtained from the Human Research Ethics Committee at the University of Adelaide (approval number H-2014-122).

Data analysis followed a qualitative, inductive process through thematic analysis: the development of theoretical strands from the data was based on initial free line-by-line coding followed by organization of codes into descriptive themes, and development of analytical

104 themes.[40] This approach mirrors the coding process along a developmental path from open
105 coding to selective coding.[41] Concurrent initial coding of completed interviews was performed
106 to adjust the general direction of questioning, if necessary, as well as to inform specific questions
107 in subsequent interviews. All transcripts were initially coded by [author 1]. [Author 2]
108 independently coded the first four interviews, after which [authors 1+2] compared and discussed
109 codes. [Author 1] then re-coded all interviews according to the combined list of codes and
110 resulting broader themes. These and additional methodological details are documented in the
111 online supplementary data.

112 ## 3. Findings

113 A number of major themes of relevance to successful policy development and
114 implementation in the area of nutrition-related obesity prevention emerged from the interviews
115 and document review (see the online appendix for a categorized overview of publications
116 identified). In the following, we use Kingdon's and the IOTF's approaches as the explanatory
117 frameworks within which we present the findings from this case study. We begin with an analysis
118 of the drivers of policy initiation, followed by a discussion of the role that evidence played in
119 policy design and justification. We then explore feasibility considerations and expert-driven
120 decision-making as two pivotal constants during the Bloomberg era. The place of regulatory
121 obesity prevention within the wider health and social policy agenda is discussed with particular
122 emphasis on stakeholders' diverging views on food access. Finally, we review the limitations of
123 New York's expert-driven regulatory approach to obesity prevention and present lessons-learned
124 as well as recommendations offered by policy-makers there.

125 ### 3.1. Executive leadership and agency expertise as a catalyst for policy development

126 All sources agreed that Mayor Bloomberg's personal interest and political investment in
127 chronic disease prevention was instrumental in establishing and advancing a policy agenda in
128 this area. His election and tenure were clearly identified as a window of opportunity:

> "You need the political will to get it done; in other words, you would need a mayor as well as a commissioner [or] other appointed official, to be able to say, this is the policy that needs to be developed and this is why. […] We did always think of Bloomberg as the public health mayor, and we knew that we were there in what I call the golden age of public health in New York City." (Interviewee 5, DOHMH)

Bloomberg also fits Kingdon's description of a prototypical policy entrepreneur whose "defining characteristic, much as in the case of a business entrepreneur, is their willingness to invest their resources- time, energy, reputation, and sometimes money"[25, p.123]:

> "Public health is always a tough sell politically. Mayor Bloomberg did it because he believed in it. Because he saw the numbers and he thought saving lives was a good thing. He was one of the few elected officials that got it and he also was unusual in that he didn't really care too much about his public image. […] We needed him, his approval, for anything important we wanted to do." (Interviewee 1, DOHMH)

Indeed, Bloomberg's election started a coupling of political and policy streams: a member of the political realm, he hooked the political will to explore and enact regulatory action to the policy stream. However, rather than presenting an endpoint where policy development moves into to concrete decision-making, the initial years were devoted to internal capacity building. This finding appears at odds with Kingdon's proposition that pitch-ready policy solutions need to be available as soon as a political event opens a window of opportunity. Instead, in this case, a policy entrepreneur, whose election in itself represented a window of opportunity, initially set about creating conditions for policy change. An integral part of this strategy was the installation of lower-level policy entrepreneurs to drive the effort at a technical level. Thus, commitment to and expertise in chronic disease prevention was built throughout the health department hierarchy: the first Health Commissioner of the Bloomberg era, Thomas Frieden, handpicked by the Mayor,[42] was described as the fulcrum for concrete policy change:

154 “He doesn’t wait for other people to generate things from the bottom up. He just says ‘this is
155 what we need to do, here’s how we’re going to do it, let’s go’.” (Interviewee 1, DOHMH)

156 In addition, an expanding workforce brought skills and experience, and a re-organization of
157 the department reflected and consolidated the focus on chronic disease prevention. A Division
158 of Disease Prevention and Health Promotion was swiftly created under the new administration
159 and later broken up into bureaus. For the first time, staff was allocated specifically to several
160 high-burden chronic diseases such as diabetes.[42] As staff numbers grew, more specialized
161 programs and bureaus were created, including the Physical Activity and Nutrition Program that
162 became part of the new Bureau of Chronic Disease Prevention and Control.

163 “The Chronic Disease Bureau did grow under the Bloomberg Administration, but it existed
164 previously because they did have a smaller program [...] particularly around maternal and
165 infant health and in tobacco control. So the Bureau grew by leaps and bounds during my time
166 under the Bloomberg Administration.” (Interviewee 5, DOHMH)

167 Current DOHMH expertise covers the whole spectrum of obesity prevention, from regulatory
168 and programmatic work to other essential components of the policy development and
169 implementation process, such as the ability to generate data and conduct outreach:

170 “The Bureau […] encompasses all the obesity work, and includes the policy work […], a
171 research and evaluation unit […], a programmatic unit […] and a communications unit. […]
172 Because there is now a policy unit, the way that the department is structured around this, I think
173 [it] streamlines a lot of things and it is a very nimble unit.” (Interviewee 3, DOHMH)

174 Against the backdrop of these enduring organizational changes, interviewees disagreed about
175 the future of obesity prevention in New York City. Some regarded the end of the Bloomberg era
176 as synonymous with the end of innovative public health interventions:

177 “We had this window. We had to take it. [...] I knew that when Mayor Bloomberg left that
178 our power would disappear.” (Interviewee 1, DOHMH)

Others pointed out the continuity in terms of expertise and commitment at agency level. They also observed change in institutional awareness and knowledge on nutrition:

> "I think that there has been a shift nationally and locally on these issues. […] The rationale and the knowledge no longer just live with us. It's a lot easier to have those conversations even within the agency these days because we've done all this work, but because they're a part of the conversation to begin with." (Interviewee 2, DOHMH)

Accordingly, despite Bloomberg's pivotal role as catalyst and enabler of policy change, institutional reform preceded policy development and had a lasting impact on policy priorities.

3.2. Evidence-driven framing of the problem and possible intervention points

Building a case for action on obesity, the first issue identified in the IOTF's framework, was also a starting point for NYC policy-makers. All interviewees identified problem severity, particularly the high and increasing prevalence of obesity and related chronic diseases, as the driving force behind policy initiation:

> "We really saw it as a major public health crisis - one that was increasing, unlike almost all of our other major health problems, which were getting better. (Interviewee 1, DOHMH)

The consistent and heavy use of evidence by NYC policy-makers has been noted previously, particularly their critical evaluation of published research and collection of local epidemiological data.[43] Local studies included the newly instituted annual Community Health Survey[42] and the more specific NYC Health and Nutrition Examination Survey whose first iteration in 2004 found high prevalence of metabolic syndrome and measures of obesity among New Yorkers and particularly minority residents.[44] This reinforced an earlier study's findings that 53% of New York City adults were overweight or obese and a quarter of residents of neighborhoods in Harlem, the Bronx, and central Brooklyn obese.[45] The problem statements introducing the rules on trans-fats[46], calorie posting[47,48] and soda portion size[49,50] made extensive reference to obesity prevalence data from these sources. In addition, other observational data indicating shifting

204 consumer behavior, including a substantial increase in the proportion of average food budgets
205 spent on prepared food, were used to define areas for intervention. Locally, DOHMH studies
206 analyzed food environments and consumption patterns, primarily in neighborhoods with
207 particularly dire health indicators. This research identified drinks as prominent characteristics
208 the limited availability of healthy foods and beverages, coupled with cost and quality concerns,
209 the ubiquity of unhealthy foods and other unhealthy foods, and high consumption of sugary
210 beverages.[51-60]

211 Within the IOTF framework, identifying potential points of intervention (issue 2) and
212 instruments with which to respond (issue 3) are underpinned by the choice to view obesity as an
213 issue amenable to successful local government intervention. Kingdon conceptualizes this as the
214 differentiation between condition and problem, subject to a "perceptual interpretative
215 element".[25, p.110] This involved understanding obesity as not only a problem for the federal
216 government, but also for local government. Accordingly, interviewees consistently viewed
217 obesity as a societal problem requiring a systemic response. City government was seen to be in
218 a position to change the food environment, with regulatory action considered an effective and
219 expedient tool. This shifting focus is also evident in the City's strategic health agenda: the
220 inaugural 2004 'Take Care New York' outlines individual-level actions for residents to take,
221 while the 2012 version privileges government action on socioeconomic levers, such as food
222 environment.[61-63] As one interviewee explained, the concentration on regulatory competencies
223 followed an early "across-the-board effort within the Health Department to update the Health
224 Code" (Interviewee 5, DOHMH) to align with expert evidence. In addition, the administration's
225 perception that regulatory measures could be used to address chronic disease risk factors was
226 reinforced by parallel evidence from successful tobacco control measures:

227 "Having achieved [tobacco control] as the first priority under the Bloomberg administration
228 around public health I think gave confidence and maybe more political will- hey, this worked,
229 and we should maybe think about that for obesity. [...] The fact that they were able to

operationalize it successfully kept that partnership [between Mayor and Health Commissioner] going and created leverage and political will." (Interviewee 5, DOHMH)

In summary, epidemiological evidence, often collected directly at city and neighborhood level, underpinned the framing of obesity as a societal problem and served to identify possible intervention points within that paradigm.

3.3. Choosing interventional targets: the primacy of feasibility

Despite substantial evidence attesting to the high prevalence of obesity and associated risk factors, decision-makers had to select concrete regulatory measures without much knowledge of their potential impact. Policy design therefore relied on program logic and practical feasibility. Interviewees noted the dearth of research on effectiveness in real-life settings:

"We were really charting the course of trying to implement what people were saying on paper should be done around policy and practice to prevent obesity, but we didn't have a blueprint." (Interviewee 5, DOHMH)

To mitigate the risks in making policies with incomplete evidence, the IOTF advocates a portfolio approach (issue 5), i.e. mixing interventions based on varying anticipated effectiveness and projected overall impact.[26] This is based on the observation that resource-intensive small-scale interventions, typically directed at high-risk groups, usually come with good evidence of effectiveness. By contrast, potentially high-impact population-wide approaches remain largely untested and often involve longer and more contextualized pathways between intervention and desired outcome. Selecting a mix of interventions serves two purposes: it helps address the multi-faceted causes and mediators of obesity. It can also counterbalance the risks associated with implementing promising population-wide interventions whose outcomes are estimated mostly through extrapolation and logic.[26] As a result, the IOTF considers such prospective evaluation (issue 4) the most challenging.[26] However, the NYC experience suggests that the selection of a comprehensive portfolio can be even more difficult. Two reasons account for this: firstly, the

255 explicit shift to population-wide interventions operates independently from interventions
256 targeting small high-risk groups. Secondly, a mix of measures as the ideal theoretical end point
257 undervalues incremental policy-making essential to innovation: evaluation results and political
258 experiences need to feed back into future policy making and act as stepping stones for new
259 initiatives. Accordingly, rather than assembling a comprehensive portfolio, practical
260 considerations and a case-by case attitude driven by a sense of urgency characterized the
261 Bloomberg administration's approach:

262 "I'd like to say that it had a whole sequenced strategic plan but it didn't. We had lots of ideas,
263 ones we felt we had a decent chance of success, which would have a big impact, we tried. We
264 all- I certainly during my time- had this intense sense of time being short. Even a successful
265 idea can take you a couple of years […], so we just had to get the ones done while we had the
266 opportunity. […] So, no, we didn't think too much about it- this works, what will we do next."
267 (Interviewee 1, DOHMH)

268 Consequently, research evidence quantifying the problem and identifying broad areas for
269 intervention also figured heavily in justification of the choice and design of interventions. The
270 trans-fat restriction proposal offers an example of the line of reasoning used in the absence of
271 conclusive evidence. With data on population-wide health impact lacking, DOHMH based their
272 case on the logic that removing a problem should naturally translate into positive health impact:
273 with the increased share of calories consumed away from home, the prohibition of trans-fats
274 would substantially reduce associated harmful effects. The notice of adoption estimates that
275 between 6% and 23% of coronary heart disease cases could be prevented.[46] The upper estimate
276 is the pooled relative risk increase associated with elevated trans-fat intake from a meta-analysis
277 of cohort studies,[64] illustrating the equating of problem magnitude and impact. To alleviate
278 concerns that the new rule would harm industry, DOHMH was able to draw on precedent from
279 Denmark.[46] Authoritative opinion such as recommendations by the US Department of
280 Agriculture and the American Heart Association as well as prior political action at federal level

281 indicating general support for similar measures rounded out the argument in both policy
282 documents[46-48] and interviewees' accounts of the process:

283 "[A] very sound rich body of scientific literature, [including] at the time a fairly recent article
284 by Mozaffarian that laid out the impact on coronary heart disease, led to identifying trans-fat
285 as something that the department wanted to focus on. In addition, the F.D.A. had a couple of
286 years prior required the labelling on nutrition facts panels of trans-fat. Prior to that it would've
287 been less feasible, though I guess doable." (Interviewee 2, DOHMH)

288 The ability to isolate problem factors accounts for a large part of feasibility considerations:

289 "We recognized that trans-fats weren't contributing to the obesity problem. They were a
290 nutritional problem - probably not the biggest nutritional problem in America, but they were
291 one that you could isolate off because it was an artificial chemical that shouldn't have been
292 in the food supply in the first place and we could just ban it. You couldn't do that with
293 saturated fats. You couldn't do that with sugar." (Interviewee 1, DOHMH)

294 Policy-makers put in place accompanying programmatic interventions designed to facilitate the
295 switch and even pushed back deadlines in response to industry complaints.[20] In retrospect,
296 interviewees appeared almost surprised how easily the rule was implemented and met targets:

297 "The restaurants just called their suppliers and said, "Send me the trans-fat free oil", and they
298 sent it and they used that. […] There was great fear that restaurants would switch from trans-
299 fat to saturated fat and it might make things worse. […] There was also fear in the industry
300 that it was going to be costly or that the products wouldn't taste good […]. All that proved to
301 be unfounded. Change proved to be very easy, and so despite the fact that we expected a law
302 suit, we didn't even get sued." (Interviewee 1, DOHMH)

303 Similar to the argument around the restriction of trans-fats, interviewees pointed to the ease with
304 which sugar-sweetened beverages could be isolated given their lack of nutritional value and
305 major contribution to excess caloric intake:

> "[A] concern I had about the rule, but which I think the health department did a very good job of allaying […] was 'why do you stop at soda'. If I go to the movies and buy a 24 ounce soda and a large popcorn, there are more calories in the popcorn than in the soda. And the response was, there is some nutritional value in popcorn, there is no redeeming nutritional value in high fructose corn syrup, it's pure calories." (Interviewee 4, Board of Health)

This argument worked for trans-fats and soda, but could not be applied to calorie posting:

> "The intent in terms of health impact between the two policies is different. […] A lot of the rationale for calorie labeling was just about consumer education. So that could be equated to tobacco control measures and policies in terms of warning labels. And not that that was the rationale that was used, but this concept of consumer education and transparency, here we're providing information so that consumers could make better, more informed choices in the hopes that that would reduce calorie consumption. And clearly stating upfront that it needed to be evaluated, and should be evaluated." (Interviewee 2, DOHMH)

While the problem statement put forward in the notices[47,48] is almost identical to the trans-fat rule, the original justification for calorie posting largely sidestepped estimates of its impact on consumption. Instead, the rationale was presented as a response to consumer acceptance of federally mandated nutrition labels on pre-packaged foods and to opinion polls supportive of calorie information in restaurants.[47] Rather than discussing the unclear anticipated effect on obesity, these arguments appear to justify the proposed intervention as in step with societal expectations. The suggestion is that this "probably reassured the board that its moves were not so far out in front of public opinion as to threaten its institutional legitimacy."[65, p.2018] It is only in the revised proposal that additional research conducted by the department prompted a more ambitious estimate of anticipated effects on consumption. The repeal and reenactment of the regulation in modified form followed a lawsuit brought by the New York State Restaurant Association. The rule was invalidated by the United States District Court for the Southern District of New York on the grounds that it was pre-empted by federal law on voluntary nutrition

claims.[10,66,67] However, by extending the scope of the original regulation to all chain restaurants rather than only those that provide calorie information in some form, legal obstacles could be addressed.[10,67] In its re-submission to the Board of Health, DOHMH estimated that the new rule would lead to "at least 150,000 fewer New Yorkers [becoming] obese, resulting […] in at least 30,000 fewer cases of diabetes" over the following five years.[48] This estimate was based on consumer responses to Starbuck's voluntary introduction of a rudimentary form of calorie posting while the regulation was suspended due to the lawsuit. DOHMH research[48] found that just under one third of consumers reported noticing the new information. Purchases by this segment of customers contained, on average, 48 fewer calories according to early data presented in the notice and 52 fewer calories according to the final published research.[48,51]

Overall, policy development was consistently anchored in research evidence. However, policy-makers also demonstrated a willingness to take a leap of faith where concrete outcomes could only be predicted based on extrapolation and assumptions. Similarly, the administration actively contributed to the evidence base by conducting in depth evaluations generating part of the evidence that was found lacking.

3.4. Balancing expert policy and decision-making with community involvement

Removing agenda-setting, policy development, and formal decision-making from the usual legislative realm and instead going down the regulatory route with the Board of Health made the entire process of policy making largely expert-driven.

> "Any time that anywhere legislative people tried to use a legislative process, it opened up the process to lobbying and industry groups coming and interrupting that process, or coming in with reasons why it would affect their businesses and that wasn't the case in any changes that were made to the Health Code. [...] I feel one of the reasons why we were able to get things done is because we had local regulations in place, and we were not beholden to elected officials and as much of the politic process." (Interviewee 5, DOHMH)

357 Rather than representing any particular constituencies or interests outside the health realm, the
358 Board is required by law to be made up of five members that hold medical degrees and another
359 five with advanced degrees in a defined health-related discipline.[68] As a result, where the Board
360 is involved, decision-makers belong to the same community of experts as those who develop the
361 policy proposals and can reasonably be expected to share similar views.

362 "Most of us keep abreast of the developments in medicine and public health, and are well
363 aware of the role that sugary beverages have played in the obesity epidemic. And we
364 reviewed, as part of the rule making process, a lot of the background documents, a lot of the
365 scientific studies." (Interviewee 7, City Health Board)

366 However, keeping all aspects of policy-making within the expert realm and moving quickly to
367 maximize the number of initiatives attempted during the exceptionally supportive and expert-
368 inclined mayoralty of Michael Bloomberg entailed sacrifices: where time was judged too short
369 to build public support for regulatory actions that would not directly be the subject of electoral
370 or legislative scrutiny, a lack of community engagement ultimately emerged as a threat.
371 Interviewees described policy development as "very guarded" (Interviewee 5, DOHMH) and
372 confined to the "four walls of the Health Department" (Interviewee 1, DOHMH) until a fully
373 fleshed out policy would be floated and rapidly prepared for formal decision-making. Some
374 participants argued that a degree of institutional secrecy was justified:

375 "New York City is a media center and especially after the early successes in tobacco, the press
376 was always looking at us ready to write a story. There is nothing we could develop [...] without
377 fear that it might leak out in the development process and we would get an embarrassing story
378 and end up really hurting our ability to get it done. So everything was done with the greatest
379 secrecy and determination that no one who wasn't in the Department could hear about this until
380 the plan was fully finished." (Interviewee 1, DOHMH)

381 Others pointed out that these isolationist tendencies came at the expense of preparatory work:

> "I think they got a little cocky because of the success of some of the earlier initiatives. […] The smoking stuff, for all the initial grumbling, got great press. And I think they got a little cocky, didn't do their political homework well enough. […] The problem was not with group politics, but with public perception […]. They might have done better to have spent six months or a year in a public relations kind of campaign and doing more public education on the subject. It would have been great to have some African-American athlete or celebrity be a spokesperson for this kind of proposal." (Interviewee 4, Board of Health)

The lack of community support became most relevant in relation to the ultimately failed attempts to address sugary beverage consumption through a state tax, exclusion from SNAP (Supplemental Nutrition Assistance Program/food stamp) benefits, and the portion cap rule. Predictably, lobbying efforts by the beverage industry were perceived as a major stumbling block in swaying public opinion and gaining legislative support. But while usual industry arguments centered on personal choice and responsibility were widely expected, industry efforts to capitalize on the diversity of NYC constituencies caught policy-makers by surprise.

> "The group that I think surprised us the most and disappointed us the most were the minority groups. On the food stamp proposal in particular, the hunger advocates came out very vocally against that. We were presented as somehow we were being mean to poor people. [...] With the portion cap, I was really shocked and terribly disappointed at the civil rights groups that came out against it [such as] the NAACP [*National Association for the Advancement of Colored People*]." (Interviewee 1, DOHMH)

During the public comment periods for the three rules that came before the board, the joint original proposal on trans-fat and calorie posting received approximately 2,200 comments, with 99% supportive of the trans-fat proposal and 97% supportive of calorie posting.[46,47] By contrast, the soda portion size rule yielded approximately 32,000 comments in support and 6,000 in opposition (~ 84% positive).[69] Despite the fact that, in all cases, written comments and oral testimony were strongly coordinated by public health advocacy organizations and researchers,

408 much greater participation on the soda rule, particularly in opposition, highlights clear
409 differences in reception. Questioning of the overall regulatory strategy itself ultimately
410 contributed to courts considering the regulation "arbitrary and capricious".[12,70,71] Reference to
411 jurisdictional limitations, namely that "food retail stores like supermarkets, bodegas, and
412 pharmacies are not subject to the proposed rule because they are regulated by the State
413 Department of Agriculture and Markets"[69] was seen as inadequate to address this criticism.

414 At the same time, industry behavior motivated at least one Board of Health member to vote
415 in favor of the soda portion cap, despite concerns over the measure's incomplete reach:

416 "The industry people were so obnoxious and so offensive that they lost me entirely. […] The
417 other thing that really bothered me is they really did a good job, from a political and public
418 relations point of view, buying off minority politicians. One of the speakers at the public
419 hearing was a City Council member from Central Harlem who read a statement that had
420 clearly been prepared by the beverage companies." (Interviewee 4, Board of Health)

421 This sentiment was echoed by other interviewees who also commented on the widespread
422 misrepresentation of the rule's content by industry lobbyists and in media coverage.

423 "In almost all the media coverage it was referred to as a soda ban, as if we were completely
424 banning soda, as if we were taking away people's rights. After the media campaign [and after]
425 pour[ing] a lot of money into groups to protest the rule, surveys were done asking New
426 Yorkers, do you think the soda ban is a good idea or bad idea? 60% thought the soda ban, and
427 again it wasn't even really a ban, was a bad idea." (Interviewee 7, Board of Health)

428 In summary, the expert-driven approach helped focus policy design on research evidence
429 without dilution by private interests, but policy-making in relative isolation from public debate
430 also left room for the public discussion to be seized by industry.

431 **3.5. Regulatory obesity prevention within the wider health and social policy agenda**

Generally supportive members of the Board of Health and the City Council had some reservations about the use of government regulation to reduce soda consumption, particularly in terms of a dichotomy with equitable access to healthy food:

> "I worry a little bit about that sort of public health approach to obesity […] Nobody has to smoke, everybody has to eat, they're different cases. There is such a powerful socioeconomic gradient associated with obesity and access to healthier alternatives, both in terms of foods and in terms of life circumstances between lower income communities and upper income communities. […] So, I would prefer a world for obesity in which we were in the position [of providing] more positive assistance for people eating more healthily and exercising more and leading more healthy lives." (Interviewee 4, Board of Health)

> "Philosophically, I would say we in the City Council had a slightly different take. [...] The Mayor looked a lot at this through the concept of food choices in a somewhat punitive way, let's limit access to this and that. [...] Where we saw things slightly differently is I'm a big advocate, as was the Council, for food access. I believe that partially why people make bad choices is because they don't understand how many calories things have, what they translate into, but also because they don't have any other choice." (Interviewee 6, City Council)

Similarly, the federal Department of Agriculture ultimately decided its rejection of New York City's SNAP exclusion request by reference to its "longstanding tradition of supporting and promoting incentive-based solutions to the obesity epidemic".[13] Against this backdrop, access to healthy food in particular was seen by the City Council as an area in which executive initiative was lacking. This perception may be attributed to DOHMH view of food access and obesity prevention as complementary, but not identical issues:

> "That whole concept of food deserts caught on at that time […], so there was an interest in the City Council, there was an interest in the Deputy Mayor's Office and so they created this Food Policy Coordinator really around increasing access to healthy foods, not so much obesity

457 prevention. Later, the two themes sort of merged, but that came from a totally different
458 direction." (Interviewee 1, DOHMH)

459 "They're related to each other by improving the food environment by bringing fruits and
460 vegetables in, by reducing the marketing because you're now marketing fruits and vegetables
461 or something else instead, you are displacing and changing the unhealthy food environment
462 at the same time. […] But I think in that sense there is a stronger community coalition around
463 that work, it's in a more natural alignment." (Interviewee 3, DOHMH)

464 Adding to may be mixed local evidence regarding the relationship between food insecurity and
465 obesity prevalence: local studies demonstrated an association of obesity with socioeconomic
466 status[72,73] and an association between neighborhood socioeconomic status and fast
467 food/convenience store density.[74-76] At the same time, research did not find any consistent,
468 population-wide association between food insecurity[77-79] and the relationship between obesity
469 and food outlet density appeared more complex than hypothesized.[80-82] In its response to
470 comments on the soda portion cap favoring better education and food access, DOHMH pointed
471 to less publicized regulatory changes and programmatic interventions.[69] In addition to a variety
472 of school food changes,[83] these included the 2006 Regulation of Nutrition in Child Care
473 Facilities,[84] the 2012 Regulation of Nutritional Requirements for Children's Camps[85] and
474 Executive Order No. 1225[86] applying food standards to city food procurement.[87] Following an
475 agreement between City Council and Mayor, the order also added a Food Policy Coordinator to
476 the Deputy Mayor's office. The position addressed the general absence of horizontal approaches
477 and bridged some of the dissonance between Council and DOHMH.

478 Local health departments' capacity to initiate and coordinate "cross-agency conversations
479 and policymaking [in order to] insert health concerns into a vast range of policymaking activities
480 within their jurisdictions"[88] has been increasingly stressed, often by reference to NYC. Yet,
481 instead of a systematic Health in All Policies approach, engagement in obesity prevention was
482 based on office-holders' personal interest:

> "In an informal way, that happened just when ideas got floated around City Hall. And there was a deputy mayor sitting at City Hall who was over health as well as the social service agencies and so that deputy mayor, to a certain extent, was an advocate for health considerations in anything that was happening. But there wasn't any formal adoption of Health in All Policy." (Interviewee 1, DOHMH)

The new role and its authority to develop city-wide food standards in cooperation with the Health Commissioner formalized cooperation at least on food policy matters. It presents a focal point for whole-of-government representation and advocacy, while recognizing that while

> "DOHMH is widely understood to have the content expertise on this issue […], this role focuses on building collaboration between and among about 15 agencies who have some operational role in food, so it's all about collaboration. Our success also depends on cooperation with New York State and regular[meetings] with similarly situated food policy advisors in cities nationwide." (Interviewee 8, City Hall)

> "Food and hunger and nutrition has been siloed in health, and I think that's a mistake. So that is something we wanted to break through by having a Mayor's office who would have a tremendous convening power at the highest levels of government, for all of the city agencies." (Interviewee 6, City Council)

To this end, the Food Policy Task Force brought together representatives from City Hall, the Departments of Health and Education, the City Council, and others to work together on policy proposals around access to healthy food. A 2008 internal review concluded that "although most of the City's food programs are developed within specific agencies, the Food Policy Coordinator appears to have been able to promote coordination between different agency initiatives, reduce programmatic overlap, improve inter-agency communications, and ultimately help bring the initiatives to fruition".[89] One of those initiatives established 1,000 permits for Green Carts, mobile food vendors providing fruits and vegetables to underserved areas.[90,91] The initiative

508 encountered unexpectedly harsh opposition from bodega owners and other businesses, similar to
509 the reception the soda portion rule would receive a few years later.

510 "It was such ill-conceived opposition, because they don't carry fruits and vegetables. Yes, if
511 we were selling soda on the street it would have been tremendous competition, but it really
512 was not going to be competition. [The opposition was] very well organized. The bodegas have
513 business associations; they give a lot of donations. The Korean business association which
514 owns a lot of greenmarkets is very well organized. I thought they would be opposed, I didn't
515 think they would be that opposed." (Interviewee 6, City Council)

516 The Food Policy Coordinator was credited in part with the eventual passage of the bill despite
517 this opposition, making it "more palatable to Council members because it was part of a larger,
518 coherent City food policy" and leveraging "relationships with community based organizations
519 [that] were critical in the development of a coalition of more than 100 organizations that
520 supported the Green Cart legislation"[89] Current initiatives advanced within the Food Policy
521 Coordinator's mandate to "increase access to and utilization of food support programs"[86] build
522 on existing infrastructure rather than aiming for new regulation or legislation:

523 "Our goal is to maximize federal dollars available through the SNAP and School Food
524 programs. This means increasing enrolment in SNAP among historically under-enrolled
525 populations and taking advantage of new provisions that allow us to apply for universal free
526 lunch in schools, and to mandate 'Breakfast after the Bell'." (Interviewee 9, City Hall)

527 Both the executive and the legislative branch claim responsibility for early rule changes and
528 programs around access to healthy foods:

529 "I would say actually we started with trying to increase access to healthy food- New York
530 City Health Bucks, that was the idea there- and with the Healthy Bodegas Initiative- that was
531 again the idea of increasing access to healthier foods."(Interviewee 5, DOHMH)

532 “We put funding in the budget to expand greenmarkets in low income areas, and to purchase
533 for the greenmarkets the technological equipment needed to allow farmers to take food
534 stamps. Now the distinction there is, an executive, in the budget, looks at it thinking big city
535 wide things. This is a smaller funding program, a couple of million dollars, but that’s typically
536 what a legislature does. […] We as the City Council also passed the first ever zoning laws to
537 incentivize supermarkets in low income areas, called Fresh Zoning. […] Basically it says if
538 you put a supermarket in your first floor, you can build a bigger building.” (Interviewee 6,
539 City Council)

540 In 2005, DOHMH introduced Health Bucks which supplements food stamps spent at NYC
541 greenmarkets with additional vouchers for fresh fruits and vegetables. The program built on an
542 initiative, funded by the City Council since 2006, to facilitate the use of newly introduced
543 electronic food stamps at greenmarkets. The example of these programs provides evidence of
544 highly complementary initiatives from executive and legislature, but the relationship with
545 DOHMH was judged uneven by the City Council. An Obesity Task Force, also convened under
546 the auspices of the Food Policy Coordinator, assembled representatives from city agencies and
547 the Mayor’s Office, but not the City Council. Plans outlined in its 2012 report[92] included a range
548 of activities related to healthy food access and nutrition education, but the most thoroughly
549 presented proposal was the soda portion cap for which legislative support turned out to be clearly
550 lacking. In addition, there was also a preference for executive solutions where legislative political
551 will could have been leveraged:

552 “Actually, [for] the trans-fat issue and the calorie count, we had Council members that wanted
553 to pass legislation to do that. […] After the Board did it we actually passed legislation to
554 codify it, so that if a future mayor wanted to get rid of it they would have to actually repeal it.
555 […] It was odd, now that I think about it, it was not consistent. [...] They may have then been
556 less collaborative with the things they were going to try jam through the Board of Health.”
557 (Interviewee 6, City Council)

Overall, the perceived dichotomy between obesity prevention and food access put the Bloomberg administration at odds not only with anti-hunger and civil rights advocates, but also with the City Council. Ceding some exclusive control over strategic directions and integrating the two issues through the Food Policy Coordinator position helped the Department of Health to maximize policy outcomes where political agreement could be reached.

3.6. Procedural and substantive limits to harnessing city regulatory powers

There was notable appreciation of the regulatory powers of the Board of Health, with one member describing it as "far and away the most powerful government body with which I have ever been associated" (Interviewee 4, Board of Health). However, the limits of executive rule-making and city authority in a federal system became very apparent. Pre-emption at state and federal level in taxation and SNAP implementation rules prevented the city from enacting a sugary beverage tax locally and banning soda from food stamp eligibility. At the same time, the at times strained relationship between legislative and executive branches and two court decisions overturning the soda portion size cap illustrates the limits of executive action, particularly where it follows the previous legislative failure of related proposals. The final ruling by the State Court of Appeals, held that the Board of Health did "exceed the scope of its regulatory authority" and "engaged in lawmaking [that] infringed upon the legislative jurisdiction of the City Council",[12] which by all accounts would have opposed the measure. Concern that such a ruling would severely restrict the executive in developing innovative regulatory approaches does not appear to have been a major concern at the time:

> "[The threat of a lawsuit] might deter us if we thought we would be sued […] because of the political price you pay for losing a lawsuit." (Interviewee 1, DOHMH)

However, with the rule struck down, the general assumption that "agency rulemaking receives deferential judicial review"[70] has been invalidated. This, in turn, may influence both future judiciary decisions and executive policy-making. One interviewee even voiced concern about spill-over effects on the Board's authority in infectious disease, concluding that

584 “it was a little irresponsible to play fast and loose with those [powers] the way they did with
585 the soda ban.” (Interviewee 6, City Council)

586 On the other hand, in the NYC context, the soda portion cap also shows how the failure of one
587 policy gave rise to creative thinking about alternatives:

588 “It's my recollection that there was a general thought in public health to think about other
589 strategies besides a tax that might be effective. […] Because the tax proposals met with such
590 opposition the thinking was let's try something else. (Interviewee 7, Board of Health)

591 All major policies were evaluated and findings disseminated in academic journals as part of the
592 administration’s commitment[93] to building the evidence base. In the short term, none of the NYC
593 interventions substantially reduced calorie intake: measures targeting food access rather than
594 obesity directly achieved some success in adding healthy choices to the food environment and in
595 increasing the use of SNAP benefits at farmers’ markets.[19,21,22,94,95] With regard to interventions
596 that made calorie intake a direct evaluation metric, calorie posting did not change restaurant
597 purchases, despite moderate increases in the number of patrons who reported noticing the
598 information.[16-18,96-98] Nevertheless, policies that fail to live up to their anticipated direct impact
599 may still achieve a degree of success not captured by evaluation designs:

600 “[Research on the effect of calorie posting] still doesn’t capture the full impact because
601 anecdotally people have talked about changing either patterns of purchases, they used to get
602 it every morning and now they only get it once a week, or that they saw that they purchased
603 a large amount of calories and compensated later in the day.” (Interviewee 2, DOHMH)

604 Most importantly, this regulation as well as proposed policies that were not enacted or
605 implemented such as the three failed soda initiatives may have changed attitudes and behaviors
606 more widely and ultimately contributed to positive health impacts.

607 “Life expectancy expanded dramatically during the Bloomberg administration. […] Sugary
608 drink consumption is plummeting and we have good data on that. Childhood obesity rates are

609 also going down in New York City right now. So a lot of things did succeed in the ultimate
610 thing we care about, even though some of the policies themselves didn't go through."
611 (Interviewee 1, DOHMH)

612 Indeed, New York experienced a general increase in life-expectancy that outpaced national
613 trends[99] and obesity prevalence among city elementary and middle school students decreased by
614 5.5% between 2006/07 and 2010/11.[100] In addition, a study of obesity prevalence among children
615 from low-income families receiving benefits under the federal WIC scheme was conducted
616 before and after the entry into force of the new childcare regulations in 2007.[101] This research
617 showed that early childhood obesity declined across New York City, with larger decreases
618 observed in neighbourhoods classed as high-risk.[101] However, these improvements, often
619 observed in studies with ecological design, do not allow any claim of causality in relation to food
620 policy. Nevertheless, antismoking laws, the first priority of the Bloomberg administration and
621 "associations with both citywide and targeted policies",[99] which would certainly include food
622 policy, are suggested as potential contributors to improved life-expectancy. Regardless of their
623 ultimate attributable health impact, these controversial regulatory measures, including those not
624 implemented, may have changed attitudes and behaviors simply through the extensive public and
625 political debate they generated:

626 "Even though we lost all those major policies [on sugary drinks], in focus groups people now
627 all tell us, 'oh yeah, that stuff is bad, I'm trying not to drink it'. So we have changed the image
628 of that product in the city. That is a success that we didn't expect, but we're pleased it happened.
629 I think, in general, there's a dynamic relationship between messages you hear in the media and
630 policy change. Messages can enable policy changes to occur. Policy changes can enable the
631 national conversation to change." (Interviewee 1, DOHMH)

632 Consequently, while key interventions did not result in substantially altered consumption
633 patterns or never made it to implementation, the overall policy effort may have contributed to
634 obesity prevention. In particular, the contentious and highly politicized debates around proposed

635 measures likely had a constructive effect in increasing public awareness and paving the way for
636 easier passage of future regulation.

637 **3.7. Recommendations proposed by NYC policymakers**

638 The lessons and recommendations for other jurisdictions put forward by interviewees
639 coalesced around three themes directly connected to key issues encountered during the policy-
640 development, decision, and implementation processes. Interviewees stressed the importance of
641 creating supportive public opinion to stave off opposition, particularly from well-resourced
642 industry. Targeted community outreach beyond mass education campaigns was seen as a key
643 ingredient. They also expressed the sentiment that shifting the focus from changing the behavior
644 of consumers to changing corporate behavior could reframe interventions as a question of justice
645 and social responsibility rather than a threat to individual choice.

646 "We should have had a broad-based coalition so we'd have done more community organizing
647 around it and made the case for community groups that this is a case where this big rich
648 industry is making money, making profits, by making you sick. You should be angry about
649 that and you should be working with us on this." (Interviewee 1, DOHMH)

650 "I would recommend that there be a lot more community support building so that especially
651 individuals and communities that are most affected by excessive soda consumption and
652 obesity are on board with this." (Interviewee 7, Board of Health)

653 Others agreed that community outreach was necessary, but should not be the primary occupation
654 of health departments. Instead, they advised harnessing relationships with experts, advocates,
655 and the media to support political decision-making and influence public opinion:

656 "I feel like that is what the public comment period was for. […] You can always do more on
657 community engagement, but that's more of the role of an advocacy organization than it is
658 probably the Health Department's or public agency's. […] I think those relationships are

critical, but it's not really the function of a public health agency to do direct community outreach- it's to engage other stakeholders to do that outreach." (Interviewee 5, DOHMH)

"I think really knowing the evidence and a strong relationship with the researchers, because they can speak to that as an independent voice as it goes out. A strong understanding of the media landscape, journalists and publications that understand public health and you can talk to and really explain, because there is a big education piece." (Interviewee 2, DOHMH)

Interviewees also confirmed that a favorable constellation of circumstances similar to Kingdon's three streams was instrumental in allowing measures to be formulated and implemented. In particular, political will, maximization of regulatory, expert-driven decision routes, technical expertise in the policy stream, and implementation capabilities were seen as critical components. However, in terms of concrete levers for future policy action in NYC, interviewees from all institutions echoed the view that the most conspicuous targets for regulatory action have already been addressed and other areas such as zoning are complex subject matters and more difficult to address from a legal and decision-making perspective.

"Part of the truth is so much was done, I'm not sure how much low hanging fruit, no pun intended, there still is. [...] In part maybe it's just stuff is harder and more time consuming now, and maybe there isn't as much urgency because they want to continue what we did and see what that yields, and then go from there." (Interviewee 6, City Council)

With regard to possible actions in other jurisdictions, interviewees suggested that policy-makers should appreciate and take advantage of the role of municipal law-making in advancing a policy agenda in this area. This is an idea that has also been stressed in previous research.[23,102] Decision-makers should pay particular attention to the varying areas of legal authority within both the executive and legislative branches in their respective local entities.

"My observation is that corporations have much more power at federal level than state, and more at state than at local. That's why we were able to innovate at local level; we didn't have

684 too much battling with corporations here. When we went to the state level, we got beat pretty
685 bad by them. The history of tobacco control showed that the innovation starts at the local
686 level and it spreads from there to the state." (Interviewee 1, DOHMH)

687 "I think what you want to do is figure out ways that you act very locally, because that's what
688 a legislature can do that a mayor can't. You want to find ways when your mayor does
689 something right to back it up. And then use whatever type of particular legislative power you
690 have as a city council, in some cities that's zoning, in others it might be tax law, every city's
691 different, and use them creatively." (Interviewee 6, City Council)

692 The trailblazing function then, more so than individual policy success or evidence generation,
693 was setting a nationally and internationally highly visible precedent of redefining what
694 conceptually encompasses municipal responsibilities:

695 "Up until this time, everybody looked to the federal government for leadership in public
696 health and state and local governments were kind of the implementation arms. […] When a
697 local health department said, 'No, we're actually going to create an agenda. We're going to
698 innovate here at the local level.' that was a pretty radical idea- that a mayor would take on a
699 public health agenda, nobody thought that would ever happen. That's not what mayors do-
700 mayors fight crime and pick up the garbage." (Interviewee 1, DOHMH)

701 No interviewee went so far as to suggest that regulatory intervention alone could substantially
702 change consumption patterns. However, there was agreement on the intermediate effect of
703 political discussion and accompanying programmatic work in changing social norms as well as
704 strong sentiment that political responsibility for public health needs to be re-defined.

705 **4. Conclusions**

706 In this paper, we have provided an in depth analysis of policy-making in obesity prevention
707 during the Bloomberg mayoralty. During this period, the New York City Department of Health
708 championed a number of interventions that directly targeted nutritional intake through

709 regulation. These included instituting stringent standards in settings in which the city acts as food
710 provider, removing trans-fats from restaurant food, requiring calorie posting in chain restaurants,
711 restricting soda portion size, proposing a statewide sugary drinks excise tax, and enforcing
712 stricter local rules for SNAP product eligibility. The latter three proposals were met with fierce
713 resistance from various quarters, including minority business organizations, civil rights
714 advocates, and the majority of the City Council. These stakeholders considered restrictive
715 approaches inequitable or harmful to small businesses and preferred regulatory and
716 programmatic work with a more enabling focus, such as access to healthy foods.

717 Our analysis related the policy-making characteristics of key Bloomberg-era regulations to
718 the models proposed by Kingdon and the International Obesity Task Force. While the
719 observations reported here largely conform to the models, we observed two crucial differences:
720 firstly, the involvement of the political stream was kept to a minimum due to the administration's
721 decision to keep decision-making largely within the domain of experts. At the same time,
722 political will played an important role in initiating and sustaining policy development. Kingdon's
723 model does not foresee the development of innovative policies from theoretical research
724 evidence nor does it take into account the need to first build capabilities for such policy
725 development to occur. Conceptualizing policy-entrepreneurs as figures that pop up occasionally
726 only to link pre-existing elements does not capture the strategic approach taken by Bloomberg
727 and lower-level policy entrepreneurs in fundamentally changing administrative structures to
728 sustain agenda change. Secondly, the expert decision-making routes favored by the Bloomberg
729 administration presented the challenge of balancing institutional secrecy, maintained for fear of
730 derailing policy development, with the need to build community and legislative support. The
731 executive branch clearly underestimated the importance of the latter two elements when it
732 decided to go down the regulatory route. As a result, the loss of the soda lawsuit, partially
733 attributed to legislative and public opposition, is now regarded as a possible inhibitor for future
734 policy innovation as the precedent weighs on future regulatory attempts. Nevertheless, there is

735 also anecdotal evidence that this and other widely discussed measures changed perceptions
736 among policy-makers and the public nationally and internationally.

737 Notwithstanding the crucial role of New York's unconventional three-term Mayor, our
738 findings may serve to encourage other jurisdictions that lack Bloomberg-style leadership to
739 explore their options for regulatory obesity prevention. In particular, other jurisdictions should
740 look to maintaining awareness of the problem and developing tailored solutions in anticipation
741 of a change in political circumstances. This research should also encourage researchers to
742 actively create policy entrepreneurs by disseminating relevant findings to receptive policy-
743 makers and by explaining the applicability of their research to specific jurisdictional contexts.
744 At the same time, our research underscored that political action and public support for a
745 particular public health agenda are intertwined and mutually supportive. This observation
746 cautions against decoupling regulatory change from programmatic interventions and highlights
747 the importance of community involvement through public education and participatory policy
748 development. Intersectoral and inclusive policy development, while more cumbersome and
749 drawn out in the short term, may prove advantageous in the long run by changing social norms
750 and paving the way for implementation of publicly acceptable and politically sustainable
751 interventions. Jurisdictions seeking to extract lessons should therefore also consider the limits of
752 regulation in isolation. Despite the international buzz generated by the precedents set in NYC,
753 decision-makers in this research clearly acknowledge the value of cross-sectoral health policy
754 approaches. In addition, much of the impact of the proposed and implemented regulatory changes
755 is described as increased awareness of the problem severity and risk factors in the general
756 population and among policy-makers outside the public health field. Consequently, while New
757 York City exemplifies innovative and pragmatic approaches to chronic disease prevention, it has
758 not transformed conventional approaches to health policy-making nor would this be conducive
759 to effective obesity prevention.

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762 **References**

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764 [1] Bloomberg M. Bloomberg Speaks on Non-Communicable Diseases at UN General
765 Assembly. Full speech.
766 http://www.mikebloomberg.com/index.cfm?objectid=88C81DF6-C29C-7CA2-
767 FCBB0555D5B99541. Published September 20, 2011. Accessed September 16, 2014.

768 [2] New York City Department of Health and Mental Hygiene. *Preventing non-*
769 *communicable diseases and injuries: innovative solutions from New York City*. New
770 York City, NY: New York City Department of Health and Mental Hygiene; 2011.
771 http://www.nyc.gov/html/doh/html/ncd/nyc-solutions.shtml. Accessed September 16,
772 2014.

773 [3] Farley T. Solving the Public Health Crisis: Lessons from New York City. *The Atlantic*.
774 September 22, 2011. http://www.theatlantic.com/health/archive/2011/09/solving-the-
775 public-health-crisis-lessons-from-new-york-city/245166/. Accessed November 18, 2014.

776 [4] Bassett M. Let's Put a Cap on Big Soda. *Huffington Post*.
777 http://www.huffingtonpost.com/mary-bassett/soda-ban_b_5445505.html. Accessed
778 November 18, 2014.

779 [5] Frieden TR. Take Care New York: a focused health policy. *J Urban Health*.
780 2004;81(3):314-6.

781 [6] Frieden TR, Bassett MT, Thorpe LE, Farley TA. Public health in New York City, 2002-
782 2007: confronting epidemics of the modern era. *Int J Epidemiol*. 2008;37(5):966-77.

783 [7] Dowell D, Farley TA. Prevention of non-communicable diseases in New York City.
784 *Lancet*. 2012;380(9855):1787-9.

785 [8] Farley TA. The role of government in preventing excess calorie consumption: the
786 example of New York City. *JAMA*. 2012;308(11):1093-4.

787 [9] Brownell KD, Frieden TR. Ounces of prevention- the public policy case for taxes on
788 sugared beverages. *N Engl J Med*. 2009;360(18):1805-8.

789 [10] Farley TA, Caffarelli A, Bassett MT, Silver L, Frieden TR. New York City's fight over
790 calorie labeling. *Health Aff (Millwood)*. 2009;28(6):w1098-109.

791 [11] Shelley D, Ogedegbe G, Elbel B. Same strategy different industry: corporate influence
792 on public policy. *Am J Public Health*. 2014;104(4):e9-e11.

793 [12] Pigott J. New York Court of Appeals. Matter of New York Statewide Coalition of
794 Hispanic Chambers of Commerce v New York City Dept. of Health & Mental Hygiene.
795 2014 NY Slip Op 04804 [23 NY3d 681]. Decided June 26, 2014.
796 http://www.nycourts.gov/reporter/3dseries/2014/2014_04804.htm. Accessed September
797 29, 2014.

798 [13] United States Department of Agriculture. Letter to the New York State Office of
799 Temporary and Disability Assistance. Food Politics website.
800 http://www.foodpolitics.com/wp-content/uploads/SNAP-Waiver-Request-Decision.pdf.
801 Dated August 19, 2011. Accessed January 21, 2015.

802 [14] Farley TA, Dowell D. Preventing childhood obesity: what are we doing right? *Am J*
803 *Public Health.* 2014;104(9):1579-83.

804 [15] Bernell B. The history and impact of the New York City menu labeling law. *Food Drug*
805 *Law J.* 2010;65(4):839-72.

806 [16] Dumanovsky T, Huang CY, Bassett MT, Silver LD. Consumer awareness of fast-food
807 calorie information in New York City after implementation of a menu labeling
808 regulation. *Am J Public Health*. 2010;100(12):2520-5.

809 [17] Dumanovsky T, Huang CY, Nonas CA, Matte TD, Bassett MT, Silver LD. Changes in
810 energy content of lunchtime purchases from fast food restaurants after introduction of
811 calorie labelling: cross sectional customer surveys. *BMJ*. 2011;343:d4464.

812 [18] Vadiveloo MK, Dixon LB, Elbel B. Consumer purchasing patterns in response to calorie
813 labeling legislation in New York City. *Int J Behav Nutr Phys Act*. 2011;8:51.

814 [19] Fuchs ER, Holloway SM, Bayer K, Feathers A. Innovative Partnership for Public Health:
815 An Evaluation of the New York City Green Cart Initiative to Expand Access to Healthy
816 Produce in Low-Income Neighborhoods. *Columbia University School of International*
817 *and Public Affairs Case Study Series in Global Public Policy*: 2014;2(22014).
818 https://sipa.columbia.edu/news-center/article/study-nyc-green-carts-expand-access-to-
819 fresh-produce-in-low-income-neighborhoods. Accessed November 2, 2014.

820 [20] Angell SY, Cobb LK, Curtis CJ, Konty KJ, Silver LD. Change in trans fatty acid content
821 of fast-food purchases associated with New York City's restaurant regulation: a pre-post
822 study. *Ann Intern Med*. 2012;157(2):81-6.

823 [21] Dannefer R, Williams DA, Baronberg S et al. Healthy bodegas: increasing and
824 promoting healthy foods at corner stores in New York City. *Am J Public Health*.
825 2012;102(10):e27-31.

826 [22] Baronberg S, Dunn L, Nonas C, Dannefer R, Sacks R. The impact of New York City's
827 Health Bucks Program on electronic benefit transfer spending at farmers markets, 2006-
828 2009. *Prev Chronic Dis*. 2013;10:E163.

829 [23] Freudenberg N, Libman K, O'Keefe E. A tale of two obesCities: the role of municipal
830 governance in reducing childhood obesity in New York City and London. *J Urban*
831 *Health*. 2010;87(5):755-70.

832 [24] Tan AS. A case study of the New York City trans-fat story for international application. *J*
833 *Public Health Policy*. 2009;30(1):3-16.

834 [25] Kingdon, JW. *Agendas, Alternatives and Publics Policies*, 2nd edn. New York, NY:
835 Longman;1995.

836 [26] Swinburn B, Gill T, Kumanyika S. Obesity prevention: a proposed framework for
837 translating evidence into action. *Obes Rev*. 2005;6(1):23-33.

838 [27] Yin RK. *Case study research: design and methods*. 4th edn. Thousand Oaks, CA: Sage
839 Publications; 2009.

840 [28] Given LM. *The Sage encyclopedia of qualitative research methods*. Los Angeles, CA:
841 Sage Publications; 2008.

842 [29] United States Census Bureau. New York (city). New York Quick Facts.
843 http://quickfacts.census.gov/qfd/states/36/3651000.html. Accessed January 20, 2015.

844 [30] United States Census Bureau. Annual Estimates of the Resident Population: April 1,
845 2010 to July 1, 2013 - United States - Metropolitan Statistical Area; and for Puerto Rico.
846 2013 Population Estimates.
847 http://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=PEP_2
848 013_PEPANNCHG.US24PR&prodType=table. Accessed January 20, 2015.

849 [31] US2010 Project at Brown University. Racial and Ethnic Diversity, 1980-2010.
850 http://www.s4.brown.edu/us2010/Diversitysorting/Default.aspx. Accessed January 20,
851 2015.

852 [32] United States Census Bureau. USA Quick Facts.
853 http://quickfacts.census.gov/qfd/states/00000.html. Accessed January 20, 2015.

854 [33] Ludwig DS, Nestle M. Can the food industry play a constructive role in the obesity
855 epidemic? *JAMA*. 2008;300(15):1808-11.

856 [34] Brownell KD, Warner KE. The perils of ignoring history: Big Tobacco played dirty and
857 millions died. How similar is Big Food? *Milbank Q*. 2009;87(1):259-94.

858 [35] Koplan JP, Brownell KD. Response of the Food and Beverage Industry to the Obesity
859 Threat. *JAMA*. 2010;304(13):1487-1488.

860 [36] Wiist WH. The corporate play book, health, and democracy: the snack food and beverage
861 industry's tactics in context. D Stuckler, K Siegel, eds. *Sick societies: responding to the*
862 *global challenge of chronic disease*. Oxford University Press, Oxford; 2012:204–216.

863 [37] Moodie R, Stuckler D, Monteiro C et al. on behalf of The Lancet NCD Action Group.
864 Profits and pandemics: prevention of harmful effects of tobacco, alcohol, and ultra-
865 processed food and drink industries. *Lancet*. 2013;381(9867):670-9.

866 [38] PLoS Medicine Editors. PLoS Medicine Series on Big Food: The Food Industry Is Ripe
867 for Scrutiny. *PLoS Med*. 2012; 9(6):e1001246.

868 [39] Chan M. WHO Director-General addresses health promotion conference. Full speech.
869 http://www.who.int/dg/speeches/2013/health_promotion_20130610/en/. Published June
870 10, 2013. Accessed September 11, 2014.

871 [40] Thomas J, Harden A. Methods for the thematic synthesis of qualitative research in
872 systematic reviews. *BMC Med Res Methodol*. 2008;8:45-55.

873 [41] Liamputtong P, Ezzy D. *Qualitative research methods*. 2nd ed. Melbourne: Oxford
874 University Press; 2005.

875 [42] Colgrove, J. *Endemic City. The Politics of Public Health in New York*. New York, NY:
876 Russell Sage Foundation; 2011.

877 [43] Laugesen MJ, Isett KR. Evidence Use in New York City Public Health Policymaking.
878 *Frontiers in Public Health Services and Systems Research* 2013;2(7).

879 [44] Jordan HT, Tabaei BP, Nash D, Angell SY, Chamany S, Kerker B. Metabolic syndrome
880 among adults in New York City, 2004 New York City Health and Nutrition Examination
881 Survey. *Prev Chronic Dis*. 2012;9:E04.

882 [45] New York City Department of Health and Mental Hygiene. *One in 6 New York City*
883 *adults is obese*. New York, NY: New York City Department of Health and Mental
884 Hygiene; 2003. http://www.nyc.gov/html/doh/downloads/pdf/survey/survey-
885 2003obesity.pdf. Accessed September 9, 2014.

886 [46] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
887 Adoption of an Amendment (§81.08) to Article 81 of the New York City Health Code.
888 2006. www.nyc.gov/html/doh/downloads/pdf/public/notice-adoption-hc-art81-08.pdf.
889 Accessed August 27, 2014.

890 [47] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
891 adoption of an amendment (§81.50) to Article 81 of the New York City Health Code.
892 2006. http://www.nyc.gov/html/doh/downloads/pdf/public/notice-adoption-hc-art81-
893 50.pdf. Accessed August 27, 2014.

894 [48] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
895 adoption of a resolution to repeal and reenact §81.50 of the New York City Health Code.
896 2008. www.nyc.gov/html/doh/downloads/pdf/public/notice-adoption-hc-art81-50-
897 0108.pdf. Accessed August 27, 2014.

898 [49] New York City Department of Health and Mental Hygiene, Board of Health. Proposed
899 resolution to amend Serving Sizes in Food Service Establishments (Health Code Article
900 81). 2012. www.nyc.gov/html/doh/downloads/pdf/notice/2012/amend-food-
901 establishments.pdf. Accessed August 27, 2014.

902 [50] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
903 Adoption of Amendment of Serving Sizes in Food Service Establishments (Health Code
904 Article 81). 2012. http://www.nyc.gov/html/doh/downloads/pdf/notice/2012/notice-
905 adoption-amend-article81.pdf. Accessed August 27, 2014.

906 [51] Bassett MT, Dumanovsky T, Huang C, Silver LD, Young C, Nonas C, Matte TD,
907 Chideya S, Frieden TR. Purchasing behavior and calorie information at fast-food chains
908 in New York City, 2007. *Am J Public Health*. 2008;98(8):1457-9.

909 [52] Alberti P, Hadi E, Cespedes A, Grimshaw V, Bedell J. *Farmers' Markets- Bringing*
910 *Fresh, Nutritious Food to the South Bronx. A Neighborhood Report from the Bronx*
911 *District Public Health Office*. New York, NY: New York City Department of Health and
912 Mental Hygiene, 2008. http://www.nyc.gov/html/doh/downloads/pdf/dpho/dpho-
913 farmersmarket.pdf. Accessed September 9, 2014.

914 [53] Rehm CD, Matte TD, Van Wye G, Young C, Frieden TR. Demographic and behavioral
915 factors associated with daily sugar-sweetened soda consumption in New York City
916 adults. *J Urban Health*. 2008;85(3):375-85. doi: 10.1007/s11524-008-9269-8.

917 [54] Huang C, Dumanovsky T, Silver LD, Nonas C, Bassett MT. Calories from beverages
918 purchased at 2 major coffee chains in New York City, 2007. *Prev Chronic Dis*.
919 2009;6(4):A118.

920 [55] New York City Department of Health and Mental Hygiene. Consumption of Sugar
921 Sweetened Beverages (SSBs) in New York City. *EPI Data Brief*. 2011;4.
922 http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief4.pdf. Accessed September 9,
923 2014.

924 [56] Dannefer R, Adjoian T, Van Wye G. Retail Audit of Sugary Drinks in Six New York
925 City Neighborhoods. *EPI Data Brief*. 2012;17.
926 http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief17.pdf. Accessed September 9,
927 2014.

928 [57] Adjoian T, Dannefer R, Sacks R, Van Wye G. Comparing sugary drinks in the food retail
929 environment in six NYC neighborhoods. J Community Health. 2014;39(2):327-35.

930 [58] Alberti P, Noyes P. *Sugary Drinks: How Much Do We Consume? A Neighborhood*
931 *Report by the Bronx, Brooklyn and Harlem District Public Health Offices*.New York,
932 NY. New York City Department of Health andMental Hygiene, 2011.
933 http://www.nyc.gov/html/doh/downloads/pdf/dpho/dpho-sugary-drinks-report.pdf.
934 Accessed September 9, 2014.

935 [59] New York City Department of Health and Mental Hygiene. Describing the Food
936 Environment in the South Bronx Neighborhood of Crotona-Tremont. *EPI Data Brief*.
937 2014;44. http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief44.pdf. Accessed
938 September 9, 2014.

939 [60] Elfassy T, Yi S, Nonas C. Perceived Access to Fresh Fruits and Vegetables in New York
940 City**.** *EPI Data Brief*. 2014;49.

941 http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief49.pdf. Accessed September 9,
942 2014.

943 [61] New York City Department of Health and Mental Hygiene.*Take Care New York 2004*.
944 New York City, NY: New York City Department of Health and Mental Hygiene; 2004.
945 http://webcache.googleusercontent.com/search?q=cache:BGaxH5pLetQJ:www.nyc.gov/
946 html/doh/downloads/pdf/tcny/tcny-policy.pdf. Acessed December 2, 2014.

947 [62] Frieden TR. Take Care New York: a focused health policy. *J Urban Health*.
948 2004;81(3):314-6.

949 [63] Summers C, Cohen L, Havusha, A, Sliger F, Farley T. Take Care New York 2012: a
950 policy for a healthier New York City. *City Health Information (CHI)*. 2009; 28(suppl 5).

951 [64] Mozaffarian D, Katan MB, Ascherio A, et al. Trans Fatty Acids and Cardiovascular
952 Disease. *N Engl J Med.* 2006;354(15):1601-13.

953 [65] Mello MM. New York City's war on fat. *N Engl J Med.* 2009;360(19):2015-20.

954 [66] Holwell R. United States District Court for the Southern District of New York. New
955 York State Restaurant Association (NYSRA) v. New York City Board of Health et al.
956 Case 1:07-cv-05710-RJH. Decided September 11, 2007.
957 http://www.citizen.org/documents/nysra_distdecision.pdf. Accessed October 16, 2014.

958 [67] Holwell R. United States District Court for the Southern District of New York. New
959 York State Restaurant Association (NYSRA) v. New York City Board of Health et al.
960 Case 1:08-cv-01000-RJH. Decided April 16, 2008.
961 http://www.citizen.org/documents/NYSRAOpinion_1.pdf. Accessed October 16, 2014.

962 [68] New York City Charter. Chapter 22, Section 553.
963 http://codes.lp.findlaw.com/nycode/NYC/22/553. Accessed October 9, 2014.

964 [69] New York City Department of Health and Mental Hygiene. Summary and Response to
965 Public Hearing and Comments Received Regarding Amendment of Article 81 of the
966 New York City Heath Code to Establish Maximum Sizes for Beverages Offered and Sold
967 in Food Service Establishments. 2012.
968 http://www.nyc.gov/html/doh/downloads/pdf/boh/article81-response-to-comments.pdf.
969 Accessed October 23, 2014.

970 [70] Renwick J. Appellate Division of the Supreme Court of the State of New York, First
971 Department. Matter of New York Statewide Coalition of Hispanic Chambers of
972 Commerce v New York City Dept. of Health & Mental Hygiene. 2013 NY Slip Op
973 05505 [110 AD3d 1]. Decided July 30, 2013.
974 http://www.nycourts.gov/reporter/3dseries/2013/2013_05505.htm. Accessed September
975 29, 2014.

976 [71] Tingling MA. Supreme Court of the State of New York. Matter of New York Statewide
977 Coalition of Hispanic Chambers of Commerce v. New York City Dept. of Health &
978 Mental Hygiene. 2013 NY Slip Op 306092013 NY Slip Op 30609(U). Decided March
979 11, 2013. https://cases.justia.com/new-york/other-courts/2013-ny-slip-op-30609-
980 u.pdf?ts=1364862721. Accessed September 29, 2014.

981 [72] Black JL, Macinko J. The changing distribution and determinants of obesity in the
982 neighborhoods of New York City, 2003-2007. *Am J Epidemiol.* 2010;171(7):765-75.

983 [73] Black JL, Macinko J, Dixon LB, Fryer GE Jr. Neighborhoods and obesity in New York
984 City. *Health Place*. 2010;16(3):489-99.

985 [74] Gordon C, Purciel-Hill M, Ghai NR, Kaufman L, Graham R, Van Wye G. Measuring
986 food deserts in New York City's low-income neighborhoods. *Health Place*.
987 2011;17(2):696-700.

988 [75] Kwate NO, Yau CY, Loh JM, Williams D. Inequality in obesogenic environments: fast
989 food density in New York City. *Health Place*. 2009;15(1):364-73.

990 [76] Neckerman KM, Bader MD, Richards CA, Purciel M, Quinn JW, Thomas JS, Warbelow
991 C, Weiss CC, Lovasi GS, Rundle A. Disparities in the food environments of New York
992 City public schools. *Am J Prev Med*. 2010;39(3):195-202.

993 [77] Stark JH, Neckerman K, Lovasi GS, Konty K, Quinn J, Arno P, Viola D, Harris TG,
994 Weiss CC, Bader MD, Rundle A. Neighbourhood food environments and body mass
995 index among New York City adults. *J Epidemiol Community Health*. 2013;67(9):736-42.

996 [78] Galvez MP, Hong L, Choi E, Liao L, Godbold J, Brenner B. Childhood obesity and
997 neighborhood food-store availability in an inner-city community. *Acad Pediatr*.
998 2009;9(5):339-43.

999 [79] Bader MD, Schwartz-Soicher O, Jack D, Weiss CC, Richards CA, Quinn JW, Lovasi GS,
1000 Neckerman KM, Rundle AG. More neighborhood retail associated with lower obesity
1001 among New York City public high school students. *Health Place*. 2013;23:104-10.

1002 [80] Karnik A, Foster BA, Mayer V, Pratomo V, McKee D, Maher S, Campos G, Anderson
1003 M. Food insecurity and obesity in New York City primary care clinics. *Med Care*.
1004 2011;49(7):658-61.

1005 [81] Yaemsiri S, Olson EC, He K, Kerker BD. Food concern and its associations with obesity
1006 and diabetes among lower-income New Yorkers. *Public Health Nutr*. 2012;15(1):39-47.

1007 [82] Viola D, Arno PS, Maroko AR, Schechter CB, Sohler N, Rundle A, Neckerman KM,
1008 Maantay J. Overweight and obesity: can we reconcile evidence about supermarkets and
1009 fast food retailers for public health policy? *J Public Health Policy*. 2013;34(3):424-38.

1010 [83] Perlman SE, Nonas C, Lindstrom LL, Choe-Castillo J, McKie H, Alberti PM. A menu
1011 for health: changes to New York City school food, 2001 to 2011. *J Sch Health*.
1012 2012;82(10):484-91.

1013 [84] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
1014 Adoption of Amendments to Article 47 of the New York City Health Code. 2006.
1015 http://www.nyc.gov/html/doh/downloads/pdf/public/notice-hc-20060615-art47.pdf.
1016 Accessed August 27, 2014.

1017 [85] New York City Department of Health and Mental Hygiene, Board of Health. Notice of
1018 Adoption of Amendments of Nutritional Requirements for Children's Camps (Health
1019 Code Article 48). 2012. http://www.nyc.gov/html/doh/downloads/pdf/notice/2012/notice-
1020 adoption-amend-article48.pdf. Accessed August 27, 2014.

1021 [86] City of New York, Office of the Mayor. Executive Order 122: Food Policy Coordinator
1022 for the City of New York and City Agency Food Standards. 2008.
1023 http://www.nyc.gov/html/doh/downloads/pdf/cardio/food-executive-order-122.pdf.
1024 Accessed August 27, 2014.

[87] Lederer A, Curtis CJ, Silver LD, Angell SY. Toward a healthier city: nutrition standards for New York City government. A*m J Prev Med*. 2014 Apr;46(4):423-8.

[88] Pomeranz JL. The Unique Authority of State and Local Health Departments to Address Obesity. *Am J Public Health*. 2011;101:1192-97.

[89] Center for Economic Opportunity. *The Office of the Food Policy Coordinator. A Program of the Office of the Deputy Mayor for Health and Human Services: CEO Internal program review*. 2008. http://www.nyc.gov/html/ceo/downloads/pdf/fpc_prr.pdf. Accessed September 22, 2014.

[90] City of New York. Rules of the City of New York. Title 24: Department of Health and Mental Hygiene›Chapter 6: Food Units. § Section 6-01: Mobile Food Units. http://rules.cityofnewyork.us/content/section-6-01-mobile-food-units. Accessed November 4, 2014.

[91] New York City Department of Health and Mental Hygiene, Commissioner of Health and Mental Hygiene. Notice of adoption of amendments to Chapter 6 (food units) of Title 24 of the Rules of the City of New York. 2008. http://rules.cityofnewyork.us/content/section-6-01-mobile-food-units. Accessed November 4, 2014.

[92] New York City Department of Health and Mental Hygiene, Commissioner of Health and Mental Hygiene. Notice of adoption of amendments to Chapter 6 (food units) of Title 24 of the Rules of the City of New York. 2008. http://www.nyc.gov/html/doh/downloads/pdf/notice/notice-adoption-chapter6.pdf. Accessed November 4, 2014.

[93] New York City Obesity Task Force. *Reversing the Epidemic: The New York City Obesity Task Force Plan to Prevent and Control Obesity*. 2012. http://www.nyc.gov/html/om/pdf/2012/otf_report.pdf. Accessed October 14, 2014.

[94] Farley TA, Van Wye G. Reversing the obesity epidemic: the importance of policy and policy research. *Am J Prev Med*. 2012;43(3 Suppl 2):S93-4.

[95] New York City Department of Health and Mental Hygiene. *New York City Healthy Bodegas Initiative: 2010 Repor*t. New York, NY: NYC Department of Health and Mental Hygiene; 2010. www.nyc.gov/html/doh/downloads/pdf/cdp/healthy-bodegas-rpt2010.pdf. Accessed September 9, 2014.

[96] Kerker P, Farley S, Johns M, Leggat P, Nonas C, Parton H. Green Cart Evaluation, 2008-2011. *EPI Data Brief*. 2014;48. http://www.nyc.gov/html/doh/downloads/pdf/epi/databrief48.pdf. Accessed September 9, 2014.

[97] Elbel B, Kersh R, Brescoll VL, Dixon LB. Calorie labeling and food choices: a first look at the effects on low-income people in New York City. *Health Aff (Millwood).* 2009;28(6):w1110-21.

[98] Elbel B. Consumer estimation of recommended and actual calories at fast food restaurants. *Obesity (Silver Spring)*. 2011;19(10):1971-8.

[99] Elbel B, Gyamfi J, Kersh R. Child and adolescent fast-food choice and the influence of calorie labeling: a natural experiment. *Int J Obes (Lond)*. 2011;35(4):493-500.

[100] Li W, Maduro G, Begier EM. Life Expectancy in New York City: What Accounts for the Gains? New York City Department of Health and Mental Hygiene: *Epi Research Report*, 2013; 1-12. http://www.nyc.gov/html/doh/downloads/pdf/epi/epiresearch-lifeexpectancy.pdf. Accessed November 5, 2014.

1071 [101] Centers for Disease Control and Prevention. *Obesity in K-8 students-New York City,*
1072 *2006-07 to 2010-11 school years*. MMWR Morb Mortal Wkly Rep. 2011;60(49):1673-
1073 1678.

1074 [102] Sekhobo JP, Edmunds LS, Dalenius K, Jernigan J, Davis CF, Giddings M, Lesesne C,
1075 Kettel Khan L. Neighborhood disparities in prevalence of childhood obesity among low-
1076 income children before and after implementation of New York City child care
1077 regulations. *Prev Chronic Dis*. 2014;11:E181.

1078 [103] Frieden TR. Asleep at the Switch: Local Public Health and Chronic Disease. *Am J Public*
1079 *Health*. 2004; 94(12): 2059–2061.