



# Community Perceptions in New York City: Sugar-Sweetened Beverage Policies and Programs in the First 1000 Days

Lucy Braid<sup>1,2</sup> · Rocio Oliva<sup>1,3,4</sup> · Kelsey Nichols<sup>1</sup> · Anita Reyes<sup>5</sup> · Jairo Guzman<sup>6</sup> · Roberta E. Goldman<sup>3</sup> · Jennifer A. Woo Baidal<sup>1</sup>

Accepted: 30 September 2021 / Published online: 7 October 2021  
© The Author(s), under exclusive licence to Springer Science+Business Media, LLC, part of Springer Nature 2021

## Abstract

**Objectives** To examine perceptions of Sugar-sweetened beverage (SSB) policies and programs focused on the first 1000 days—gestation through age 2 years—among community stakeholders in Washington Heights and the South Bronx, two neighborhoods in New York City with disproportionately high prevalence of childhood obesity.

**Methods** A multilevel framework informed interview guide development. Using purposeful sampling, we recruited study participants who were (1) able to speak English or Spanish and (2) resided or employed in Washington Heights or the South Bronx. Participants included community leaders (local government officials, community board members, and employees from community- and faith-based organizations) as well as community members. Trained research staff conducted semi-structured in-depth interviews. Using immersion/crystallization and template style coding, the study team performed thematic analysis until no new relevant themes emerged.

**Results** Among the 19 female study participants, perceived facilitators to SSB policy and program implementation included sustained partnerships with broad coalitions; continual education and clear messaging; and increased accessibility to healthier beverages. Perceived barriers included systems-level challenges accessing programs that support healthy beverage options, and individual-level lack of access to affordable healthy beverages. Acceptable potential intervention strategies included messaging that emphasizes health in pregnancy and infancy; policies that require healthy beverages as the default option in restaurants; and policies that remove SSBs from childcare settings. Some strongly favored SSB excise taxes while others opposed them, but all participants supported reinvestment of SSB tax revenue into health resources among marginalized communities.

**Conclusions** A multi-pronged approach that incorporates engagement, access, equitable reinvestment of revenue, and continual clear messaging may facilitate implementation of policies and programs to reduce SSB consumption in the first 1000 days.

**Keywords** Sugar-sweetened beverages · Obesity · Low-income · Policy · Nutrition

## Significance

*What's already known* Prevalence of sugar-sweetened beverage (SSB) intake is declining among some subpopulations in the United States. SSBs are still widely consumed and contribute to racial, ethnic, and socioeconomic disparities in childhood obesity and related chronic disease.

*What's new* Community engagement and clear messaging about the health and financial benefits that marginalized communities will receive from SSB policies may help increase support for policies and programs to reduce SSB consumption starting early in life.

## Introduction

In New York City (NYC), geographic disparities in health are apparent early in life (Schonfeld & Sweeney, 2018). Racial/ethnic and socioeconomic segregation exists, and residential zip code is tied to health outcomes (NYC Health, 2019). These disparities are the result of decades

---

Lucy Braid and Rocio Oliva have contributed equally to this work and are co-first authors.

---

✉ Jennifer A. Woo Baidal  
jw3286@cumc.columbia.edu

Extended author information available on the last page of the article

of structural racism, discriminatory redlining and zoning, and inequitable policies, and are even more pronounced in the wake of COVID-19 (Adhikari et al., 2020; Gee, 2008).

Racial/ethnic and socioeconomic health disparities are particularly concerning when it comes to obesity and related chronic diseases, as chronic disease is the leading cause of death for New Yorkers, and obesity is linked to severity of COVID-19 (Yi et al., 2014). These disparities originate early in life and portend disparities in acute public health crises, as evidenced by the disproportionate number of Black and Hispanic/Latino people who die from COVID-19 (Webb Hooper et al., 2020). By early childhood, racial/ethnic disparities in obesity have already emerged, which suggests the need for earlier intervention and restructuring of the systems that undergird these disparities (Blake-Lamb et al., 2016). Washington Heights has a population of almost 200,000, of which 23% consume SSBs every day. Similarly, close to 400,000 people live in the South Bronx communities, and about 30% of them consume SSBs daily (Community Health Profiles). In Washington Heights, almost half of children aged 5–14 years have overweight or obesity (A Foodscape of Washington Heights/Inwood, 2017), and in the South Bronx, about 40% of children aged 5–14 years have overweight or obesity (A Foodscape of The South Bronx, 2017). Modifiable risk factors in the first 1000 days—gestation to age 2 years—mediate racial/ethnic disparities in childhood obesity, making this a critical period to intervene for childhood obesity prevention in NYC neighborhoods like Washington Heights and the South Bronx (Woo Baidal et al., 2016).

The disproportionate burden of obesity among marginalized populations highlights the urgent need for policies to achieve health equity. Excessive intake of added sugars, especially in the form of Sugar-sweetened beverages (SSBs), is a risk factor for obesity (Muth et al., 2019). Specifically, increased SSB consumption during pregnancy is associated with greater adiposity in mid-childhood (Gillman et al., 2017), and SSB consumption in infancy significantly increases the likelihood of obesity at age 6 years (Pan et al., 2014). These findings suggest that pregnancy and infancy are critical periods for establishing healthy beverage consumption. SSB intake is highest in Hispanic/Latino and non-Hispanic Black children in NYC (Adjoian & Lent, 2017). Despite continued efforts to decrease SSB consumption in Black and Hispanic/Latino communities, childhood obesity disparities persist in NYC.

There is a dearth of data in the qualitative literature focusing on community perceptions of SSB programs and policies in Black and/or Latino populations in NYC. However, mounting evidence shows community participation plays a key role in advocacy and implementation of health promoting policies. In San Francisco, a study found that community engagement is essential to mobilize advocacy and successfully restrict SSB purchases (Grumbach, 2017). In this study,

we sought to understand community perceptions of policies and programs targeting reduction of SSB consumption in the first 1000 days in two neighborhoods where there is a high prevalence of childhood obesity and the majority of residents identify as Black and/or Latino (A Foodscape of Washington Heights/Inwood, 2017; A Foodscape of The South Bronx, 2017).

## Methods

### Study Design and Approach

We performed a qualitative research study to elicit perceptions of interventions aimed at reducing SSB consumption in pregnancy and infancy, including perceived facilitators and barriers of implementing such interventions in Washington Heights and the South Bronx. We recruited stakeholders from different sectors of the community.

### Conceptual Framework

The conceptual framework of this study is based on a modified version of the Glass and McAtee model of the multilevel influences of behavior (Glass & McAtee, 2006). The current study focused on SSB interventions at the macro (e.g., SSB taxation and policies), meso (e.g., targeted health messaging campaigns), and micro (e.g., community level programs) levels. We organized our codebook, analysis, and results according to different levels of influence.

### Study Setting and Participants

We conducted semi-structured, in-depth interviews with community members and leaders from Washington Heights and the South Bronx. We used purposive and snowball sampling to recruit participants from Community-based organizations (CBOs), faith-based organizations, childcare centers, and local government. These organizations were selected because they have influential power on community members and SSB community programming most relevant to this study. Participants were considered eligible if they were older than 18 years and lived in Washington Heights or the South Bronx. Community members with no experience with pregnancy or infancy and those who could not answer questions in English or Spanish were excluded. All leadership levels were invited to participate if they met eligibility criteria. Interviews took place in-person at Columbia Community Partnership for Health or at participants' place of work. Interviews occurred between July and November 2019.

## Instrument Development

We performed a literature review to identify existing and effective interventions, policies, and public health campaigns aimed at reducing SSB consumption. After multiple meetings with co-authors, including community members or community organizers, we developed a semi-structured interview guide (Table 1) and provided visual aids including images of various SSBs, infographics of SSB policies and programs, and a short video about the harmful effects of SSB consumption. All materials were available in English and Spanish.

## Data Collection

After participants provided informed consent, they completed a demographic questionnaire and a 60-min, in-person, individual, semi-structured interview in English or Spanish. All interviews were conducted by trained interviewers concordant with participants' language preference. All interviews were audio-recorded and transcribed verbatim in English or Spanish with an English translation for analysis. Detailed notes were taken by research staff to account for non-verbal cues. Compensation was given to all participants

in the form of a \$50 gift card. Interviewing occurred until data saturation was reached, as ascertained by the team during their iterative analysis of the transcripts. The New York City Department of Health and Mental Hygiene (NYC DOHMH) provided conceptual support in study design and identifying relevant public health programs and policies, and the Institutional Review Boards of Columbia University Medical Center and NYC DOHMH approved all study protocols.

## Analytic Approach

We performed data collection and analysis in iterative cycles. First, we conducted content analysis using immersion/crystallization techniques (Borkan, 1999), which involved research staff listening to the audio-recorded interviews and reading the transcriptions. The analytic team met recurrently to review transcripts and notes from previous interviews and discuss emerging themes. Next, we utilized notes from weekly meetings to develop a codebook for template style analysis (Crabtree & Miller, 1999). The codebook was modified as necessary to accommodate the need for additional codes. Interviews were coded using NVivo Version 12 by two investigators (LB, KN) for the

**Table 1** Interview guide domains and sample interview guide questions

Domain	sample questions
<i>Subdomain</i>	
General perceptions of interventions to promote healthy nutrition in pregnancy and infancy	
<i>Acceptability, facilitators, and barriers: Community leader perspective</i>	Is your organization involved in any programs that deal with nutrition during pregnancy and infancy? Please tell me about them What helps your organization get involved with these types of programs?
<i>Acceptability, facilitators, and barriers: Community member perspective</i>	Have you been involved with any programs that deal with nutrition during pregnancy and infancy? How important do community leaders think nutrition is during pregnancy and infancy?
Perceptions of SSB-specific Interventions	
<i>Macro level: General policies</i>	What is your opinion about introducing taxes to reduce SSB consumption? How do you think your community would want to see the money from a tax like this used?
<i>Meso-level: Wellness policies</i>	Part of this law is that only unsweetened/unflavored milk can be served to children. This means no chocolate or strawberry milk. What are your thoughts on this?
<i>Meso-level: Messaging</i>	What has been your experience with health messaging in general? Is it a good idea to compare sugary drinks to cigarettes, why or why not?
<i>Micro-level: Community-based programming</i>	What about people in your community, how do you think they learn about programs like Shop Healthy and the Healthy Beverage Zone?
Perceptions for best ways to address SSB consumption in pregnancy and infancy	
<i>Overall preferences</i>	What other members of mothers' or parents' social network (including family members) would need to be on board to eliminate SSBs from the diets of pregnant women and infants?

first five interviews, and one main coder (LB) thereafter. In recurring meetings, the analytic team ensured coding was appropriate and used the software's code query reports for further immersion/crystallization analysis and resolved any discrepancies in understanding of the data until reaching final interpretation of the findings.

## Results

### Participant Characteristics

We interviewed nine community members and 10 community leaders. Eight participants were from Washington Heights, and 11 were from the South Bronx. Leaders included local government officials, community board members, and employees from CBOs and faith-based organizations. Of the 19 interviews, 12 were conducted in English and seven were conducted in Spanish. Most community members identified as Hispanic/Latina/Spanish, and some identified as Black/African American. Most community leaders who participated in this study identified as white/Caucasian, and some identified as Hispanic/Latino. All participants identified as female. Ages ranged from 28 to 60, mean [SD] age was 40 [7] years.

### Perceived Facilitators and Barriers to Policy and Program Implementation (Table 2)

**Long-Term Engagement with Broad Coalitions of Stakeholders is Necessary for Successful Public Health Programming and Policy** Almost all participants emphasized the importance of building committed coalitions with a diverse range of stakeholders when implementing public health programming and policy. Examples of these stakeholders included small businesses, schools, bodegas, and parks departments. Several participants stressed the importance of long-term partnerships. Many participants cited community buy-in as crucial to generate support for SSB policy, and several brought up the idea of “meeting people where they are at” as a way to build community trust. Examples of this included offering alternatives to unhealthy beverages, making an effort to work around families' schedules, and supporting community-driven change rather than “demanding” it.

**Continual Education is Key but Not Enough on Its Own to Reduce SSB consumption** Many participants believed that consistent, repetitive messaging at the macro, meso, and micro levels needs to be partnered with policy and programming to generate meaningful change in SSB consumption. Several participants stated that visual aids and images that portrayed beverage sugar content and harmful effects

**Table 2** Perceptions of facilitators and barriers to implementation of SSB policies and programming during the first 1000 days

Topic	Themes <i>Illustrative quotes</i>
Community support	<p>Long-term engagement with broad coalitions of stakeholders is necessary for successful public health programming and policy.</p> <p><i>“You can't just create a policy that's going to most affect certain communities and not be aware of that. Create a coalition.” -CBO employee, South Bronx</i></p> <p><i>“To guide [people], educate them, for them to see what are the benefits for you once these rules are implemented. That is going to help them to decide and say, let's keep it in mind, it's very important, [community leaders] are watching out for our health, that's why it's being done. The community must be informed and guided—by creating support groups in the community, they will realize that it affects their health and that's why it's being done, and maybe they will regulate it—we're going to limit consumption of things that aren't good for us.” -Community member, South Bronx</i></p>
Education	<p>Continual education is key but may not be enough to reduce SSB consumption.</p> <p><i>“As I said, education alone doesn't necessarily change behavior, but legislation alone doesn't change behaviors for what's going on in the house. If it's coupled with some education, then I think you get a win-win.” -WIC employee, South Bronx</i></p> <p><i>“Training Leaders in our communities, so they can educate us and they can win the trust of the neighborhood—of the people. Spread the message by word-of-mouth, among friends, and organize it thus, go to churches, schools and educating the community” -Community member, South Bronx</i></p>
Accessibility	<p>In Washington Heights and the South Bronx, programs working to address the lack of accessibility of healthy, affordable foods are often also difficult to access.</p> <p><i>“I think that sugar-sweetened beverages and other high-fat, high-sugar foods are much less expensive. There's much easier access. They are foods that are placed right by the check-out counter, even if it's a supermarket or a bodega. In my community, we don't have supermarkets. It's mostly bodegas or very small supermarkets” -Child care center employee, Washington Heights</i></p> <p><i>“Here in Washington Heights there's only one [farmer's market], on I75. Basically, having more places where people can—as I said—if there were nutritional places here—I've seen a few, but everything is very expensive. When it's so expensive, people don't buy it.” -Community member, Washington Heights</i></p>

of SSBs most effectively convey risks associated with SSB consumption and promote healthy beverage consumption.

**In Washington Heights and the South Bronx, Programs That Address the Lack of Accessibility of Healthy, Affordable Foods are Often Also Difficult to Access** Many participants noted that healthy foods and beverages are not easily accessible or affordable in Washington Heights and the South Bronx. While some participants emphasized the importance of access to healthy food, others emphasized the need for conveniently timed and located nutrition/health programs. Participants universally believed that time and distance constraints play a major role in determining the accessibility of nutrition programs and resources. Conversely, several participants mentioned the abundance of unhealthy foods and fast food restaurants in these neighborhoods and suggested this might prevent people from eating healthfully. Both community members and leaders stated that parents in these communities generally want their children to eat healthfully, but lack of access to healthy food and health education programming is a major barrier.

### *Perceptions of Potential SSB Interventions (Table 3)*

#### **Macro Level: General Policies**

**SSB Taxes Remain Divisive, But There is Broad Support for Using Tax Revenue to Fund Community Improvement** While most participants were in favor of an SSB tax, some strongly opposed it and believed it would not be an effective strategy to decrease SSB consumption. Participants in support perceived that an excise tax would help to curb SSB consumption by reducing access to unhealthy beverages and increasing community awareness of SSB-related health consequences. Conversely, community members who opposed the tax believed that SSB consumption is an addiction, and therefore those who consume SSBs would not be willing or able to reduce consumption regardless of cost. Others expressed distrust in the government and were concerned that revenue from SSB taxes would go to the state rather than to communities. Community leaders who opposed the tax feared the tax would “punish” families of low socioeconomic status.

When asked how revenue from an excise tax should be used, all participants expressed a desire for community improvement. Many stated that tax funds should be returned to the community from which they were collected. One participant stressed the importance of avoiding a “tax for nothing.” Most participants felt tax revenue should be used to fund health/nutrition education programs, improve community parks, launch awareness campaigns, and improve schools.

**Non-SSBs as Default Kids’ Meal Option in Restaurants Will Decrease Child SSB Consumption** Community members and leaders supported policies that require restaurants to provide drinks without added sugars as the default beverage in children’s meals. Under Int. 1064–2018, a NYC-specific law that amends the administrative code of the city in relation to selections for beverages included in children’s meals, parents can still request a different beverage at no additional charge, but the default beverage is water, low-fat milk, or 100% fruit juice (Int. 1064–2018). Almost all participants agreed that making healthy beverages the default option would be an effective strategy to decrease children’s SSB consumption. Overall, the element of choice was viewed as positive; however, some felt this law could go further in terms of restrictions. One participant noted “parents can still substitute for the beverage. That’s the problem, the asterisk.” Several community members suggested there may be initial resistance from parents regarding the law—both because of a lack of education and a feeling that the government is “dictating to them how to live.” Although this law (Int. 1064–2018) passed in NYC in April 2019 prior to this study, few community members were aware of its existence.

#### **Meso Level: Wellness Policies and Messaging**

**Reducing Juice and Sugary Drink Availability in Childcare Settings Can Deter SSB Consumption, But Parents May be Initially Resistant** All participants were in favor of Article 47 of the NYC Health code, which prevents federally funded group childcare centers from serving beverages with added sugars, including flavored milks, and limits the amount of 100% fruit juice that can be served to 4 oz. One participant expressed reservations around the restriction of chocolate milk but supported the regulations overall. Several community members referred to the regulations as “perfect,” and community leaders generally believed that the regulations “make a lot of sense,” although some felt the regulations could go further to completely remove juice from childcare environments. Several participants said that restricting SSBs in childcare settings could help to reduce dental disease, hyperactivity, and sugar addiction among children. Many participants thought parents might be more hesitant to accept regulations than children but believed they would eventually support the bill. Some participants mentioned children’s adaptability, with one stating “If you don’t give it to a kid they won’t know what they’re missing.”

**Video Messaging Equating the Health Hazards of SSBs to Tobacco is Seen as Impactful by Some and as Confusing by Others** Interviewers showed participants “Which One,” a video released by the NYC DOHMH that compares the health hazards of SSB consumption and tobacco use. While community leaders were more skeptical than community

**Table 3** Perceptions of potential interventions to reduce SSB consumption during the first 1000 days

Intervention domain	Specific intervention	Themes and illustrative quotes
<i>Macro level:</i> General policies	SSB taxes	Excise taxes remain divisive, but there is broad support for using tax revenue to fund community improvement. <i>“That’s one thing that we really believe though in. If you’re gonna create a policy like this, all of this money has to go back into communities like the South Bronx, where people are more disproportionately affected. That, I think, would be a requirement for us.”</i> -Community leader, South Bronx <i>“Sometimes there are programs to help people who need it, low-resource people. They could use that money for that.”</i> -Community member, South Bronx
	Policies to require restaurants to provide drinks without added sugars as the default beverage in children’s meals	Making healthy beverages the default option is a strategy that will help decrease SSB consumption in children. <i>“Yeah, cuz we all have such decision fatigue, especially parents. Taking the thought out of it makes it just easier. Making the healthy choice the easy choice. Just default easy healthy. I don’t know. I think it definitely helps.”</i> -CBO employee, South Bronx <i>“I think it’s a positive step because you want to make sure that soda is just not always at the forefront of their decision making, you know.”</i> -Local government employee, South Bronx <i>“It will help parents think about it twice. They’ll say, ‘There’s a better option.’ Yes, it will help having that in the menu. Because as I said, as a parent, you’d think about it twice before you give them a sugary drink instead of the other one.”</i> -Community member, South Bronx
<i>Meso-level:</i> Wellness policies	Regulations that ban federally funded group child care centers from serving any beverages with added sugars, including flavored or sweetened milks, and limit the amount of 100% fruit juice to 4 oz	Reducing juice and sugary drink availability in child care settings can improve SSB consumption but parents may be initially resistant. <i>“I think that as long as families are informed and they’re being told and they understand the repercussions of, ‘Listen, these are what these sugary beverages are doing to your child versus if you feed them this, ‘they’ll understand.’”</i> -Child care center employee, Washington Heights <i>“This is good for children’s health. It’s very good to avoid sugary beverages throughout the day. It’s too much. A small portion is perfect, because it helps their health, it prevents obesity, prevents early diabetes in children  I know there will be families who won’t be accepting that easily, but there will be moms who will be very happy to have their children’s meals regulated. Every mother wants the best for her child. Every mother wants her child to be healthy.”</i> —Community member, South Bronx

**Table 3** (continued)

Intervention domain	Specific intervention	Themes and illustrative quotes
<i>Meso-level:</i> Messaging	Messaging in schools	<p>Most participants were unfamiliar with messaging in schools. <i>I don't know what they're teaching in school. I know back in the day... some lady would have health class or whatever.</i> -Community leader, South Bronx</p> <p><i>I don't know if they're giving children these messages.</i>" -Community member, South Bronx</p>
	Video messaging equating the health hazards of SSBs and tobacco	<p>Comparison of SSBs to cigarettes is viewed by some as impactful, but others feel confused by the message.</p> <p><i>"Now if you're equating that with, you know, soda with tobacco, it can be a little strong a message. At the end of the day, I think there's an alert here, right, because we do think that soda and a lot of the sugary stuff is very benign. The collective impact of that over years and we see how it impacts the body. In a lot of ways, it's important to kind of ring the bell and say, "This is urgent. This is an emergency. This is just as dangerous. It may not have the secondary impacts that smoking has, but it is just as dangerous." -Local government employee, South Bronx</i></p> <p><i>"What's the message here? This makes it harder for them to get the message, for me to get the message. This kind of thing you need to make an impact. A message that people can learn, "Oh, okay." The kids can all learn, but this one none of them are good. Even the one they say it's not good, well why they sell it then? The kids will think, "Well, why they sell it if they say it's not good?" -Community member, South Bronx</i></p>
<i>Micro-level:</i> Community-based programming	Community programs (Shop Healthy, Healthy Beverage Zone)	<p>Though participants were in favor of community-based programming, most were unfamiliar with existing programs.</p> <p><i>"No, but now that I know about them, yeah, I'm definitely gonna write this down. I would like to partner up and work with programs like this."</i> -Community leader, Washington Heights</p> <p><i>"Maybe they haven't, because if I haven't heard about it, and I'm very aware of this topic, I can imagine others haven't either."</i> -Community member, Washington Heights</p> <p><i>"It's good that they are motivating us to consume healthier products, and with less sugar. Especially since in the stores-oh, my God-there a whole range of things that you sometimes don't know about. So, people don't even know how to read the label on the back. Thanks to the programs, we have learned how to make better purchases."</i> -Community member, Washington Heights</p>

members around this messaging campaign, both groups were generally supportive. Participants used words like “strong,” “impactful,” and “direct” to describe the message, and several participants believed it was a good idea to compare SSBs to cigarettes because they are both addictive and “both kill.” Some believed that community members may not fully understand how harmful SSBs are and that this video could help raise awareness.

While participants were mostly supportive of the video campaign, some held reservations about the comparison of SSBs to cigarettes. One community member and one leader strongly opposed the comparison, describing the video’s message as “confusing” and misleading because tobacco use is more harmful than SSB consumption and also has the capacity to harm others. Others who felt conflicted about the video’s message stated that the comparison of SSBs to cigarettes is like “apples to oranges.” Several participants were concerned that they had never seen this video campaign.

### Micro-Level: Community-Based Programs

**Though Participants Were in Favor of Community-Based Programming, Most Were Unfamiliar with Existing Programs** Most participants were unfamiliar with Shop Healthy NYC and the Bronx Healthy Beverage zone, two community-based programs that work to promote healthy beverage consumption in NYC communities with high rates of obesity. Of those who were familiar with these programs, almost all were community leaders, and most were only familiar with Shop Healthy NYC, a program led by the NYC DOHMH that encourages local stores to increase promotion of healthy foods and encourages healthier purchasing by placing healthier items, such as water, at eye-level and near cash registers (Shop Healthy – NYC Health, 2013). Participants were conflicted about the effectiveness of this program, and one person noted “it’s really funny because it totally depends who you ask how successful it is.” Several who were unfamiliar with community programs expressed an interest in learning more about them.

## Discussion

In this qualitative study of community members and leaders in Washington Heights and the South Bronx, most participants believed a multi-pronged approach is necessary when implementing interventions to reduce SSB consumption during the first 1000 days of life. Strategies that incorporate community engagement, access to programs and healthy beverages, funds reinvestment, and continual clear messaging and educational campaigns may help with implementation of policies and programs. Effective policies to curb SSB consumption during this critical period of development

could help reduce childhood obesity and provide a strong foundation for lifelong health.

Limited access to healthy beverages, targeted product placement, and advertising placement practices that reinforce structural racism in Black and Hispanic/Latino communities contribute to health disparities (Dowling et al., 2020). In this study, participants stated that lack of access to healthy beverages and exposure to confusing health messaging were barriers to uptake of policies that support SSB avoidance in the first 1000 days. A systematic review of childhood obesity among Hispanic/Latino children emphasized the importance of cultural influence and suggested that providing culturally appropriate materials can lead to more successful implementation in this community (Branscum & Sharma, 2011). Results from our study support use of culturally inclusive messaging, as well as restricting racially targeted advertising of SSBs. Because participants were strongly in favor of policies and programs that strive to improve the health of pregnant women, infants, and children, this suggests a shift in health messaging to focus on the health of these populations might also be a facilitator to reduce SSB consumption.

Our findings support existing literature showing that community member engagement is crucial for the successful implementation of SSB-curbing policies. Among our interview participants, SSB tax policy was a controversial issue. In a prior qualitative study, messaging on the health effects of SSB consumption and plans to reinvest funds into obesity prevention programs were perceived by policy experts as strategies to generate community support for SSB taxes (Jou et al., 2014). A recent qualitative study in South Africa revealed participants’ perception that funds generated from SSB taxes should be directed back into programs for youth development and mass media education (Kaltenbrun et al., 2020). In our study, despite providing participants with evidence of the effectiveness of SSB taxes in California, some interview participants were skeptical about how tax revenue would be reallocated in New York City, and mistrust of government contributed to a lack of belief that revenue from an SSB tax would benefit Black and Hispanic/Latino communities. In order to offset mistrust around a future SSB tax, NYC politicians should consider combining policy efforts with community-focused awareness campaigns that delineate exactly how and when funds will be used to improve health outcomes in low-income NYC communities.

Amid the COVID-19 crisis, many cities are looking for creative ways to protect the health of communities. In two Mexican states, officials believe that banning junk food sales to minors will reduce rates of obesity and diabetes and, consequently, reduce the deadly effects of COVID-19 (Fredrick, 2020). Furthermore, in Mexico, taxation policies reduced SSB purchasing in low-income communities the most and this effect was maintained even two years after



implementation of the SSB tax (Colchero, 2017). In Seattle, the SSB excise tax, which was implemented in 2018 (CHOICES Project, 2018), has yielded a 22% decrease in SSBs sales (Powell & Leider, 2020), and during the COVID-19 epidemic, SSB tax revenue has funded food-assistance programs and provided thousands of low-income families with supermarket vouchers (Beekman, 2020; Yan, 2020). Two studies from California where SSB taxation has been successful found that community advisory boards were essential for adequate revenue allocation to the most underserved communities (Asada, 2021; Falbe, 2020). The incorporation of tax revenue regulations that restrict funds to community reinvestment into future SSB policy and the creation of advisory commissions will be integral to increasing community support for SSB taxes in Washington Heights and the South Bronx. Our findings suggest that widespread engagement combined with messaging about the health consequences of SSB consumption and equitable allocation of SSB tax revenue may help garner support for an SSB tax policy among Black and Hispanic/Latino communities.

In general, community members felt similarly to those in leadership roles about barriers and facilitators to SSB policies in NYC, with the exception of barriers to SSB tax implementation. Community leaders were concerned about the tax unfairly affecting low-income families, while community members were concerned about addiction and inability to change behaviors. Though a 2019 study examining addictive properties of SSBs found preliminary evidence of withdrawal symptoms and increased cravings during cessation (Falbe et al., 2019), a study of the Berkeley Soda Tax found that simply enacting an excise tax was enough to alter consumers' SSB purchasing behavior (Taylor et al., 2019). Furthermore, a main criticism of excise taxes is that they place an undue burden on low-income populations, so it is notable that community members expressed less concern over equity and more over the effectiveness of the tax compared to community leaders. The CHOICES research group estimated that households spend less on SSBs after an excise tax goes into effect, providing disposable income for other purchases (CHOICES Project, 2018). Similarly, in Philadelphia, a study found significant declines in volume of taxed beverages sold after the implementation of an SSB tax- specifically in small independent stores more frequented by low-income populations (Bleich et al., 2020; Roberto et al., 2019). The combined findings from the CHOICES group and the Philadelphia tax suggest that the greatest long-term health benefits and reductions in health care costs will accrue to low-income consumers, who consume more SSBs.

Participants generally favored policies aimed at impacting drinking behavior in the first 1000 days and improving the health of children, such as policies targeting children's meals and beverage regulations at childcare centers. Studies in Baltimore and California found that subtly influencing or

“nudging” the choices of families in restaurant settings has high rates of community acceptability, increases understanding of the benefits of healthy beverages, and reduces SSB consumption (Yang & Benjamin-Neelon, 2019). While this tactic may not be as effective as an SSB tax, it makes the healthy choice the easy choice and supports a culture of healthy beverage consumption (Bleich et al., 2020). Participants had high acceptability of the regulation of juice and flavored milk at childcare centers. Participants showed less support for community-based programming that requires active participation because of time and distance barriers.

A limitation of this study is the inherent ambiguities of human languages, especially with Spanish and English translations. To minimize potential bias, all interviewers were trained in culturally sensitive interviewing techniques, and all interviews were language concordant. Because all participants spoke English or Spanish, perspectives may not represent the views of people in NYC who speak other languages. Although our participation criteria did not exclude persons of other genders, all participants identified as women, and therefore our results may not reflect the perspectives of persons of other gender identities. Additionally, this study has a small sample size and low generalizability. However, through purposive sampling of community leaders and members, we ensured inclusion of individuals with the range of demographics and perspectives relevant to this study. Despite these limitations, this study provides key information about two low-income neighborhoods greatly affected by childhood obesity.

Despite a growing body of evidence linking SSB consumption and adverse health outcomes, there is little known about community awareness and perceptions of SSB programs and policies in low-income Black and Hispanic/Latino communities. Though some studies have explored community perceptions of SSB policies and programs, this is the first study to focus on the perceptions of low-income Black and Hispanic/Latino communities. Low-income communities of color are disproportionately affected by obesity and are more likely to consume SSBs, and therefore more research around strategies to more effectively implement SSB interventions in these communities is necessary.

## Conclusion

In this qualitative study, community members and leaders who were interviewed in Washington Heights and the South Bronx supported the creation of healthier environments for children and were amenable to many current and potential SSB policies. Community members perceived that the main barriers to healthy beverage consumption included lack of access to healthier beverage alternatives, lack of knowledge about the health effects of SSBs, and

challenges with accessing community programming. A few had concerns that SSB consumption was an addiction. Community leaders cited the main barrier to SSB policy implementation as lack of community support for policies. Both community leaders and members in this study favored childcare beverage regulations that made the healthy choice the default choice. Participants perceived that a multifaceted approach to SSB policy is necessary to reduce SSB consumption.

Disparities in COVID-19 mortality rates have underscored the role that race, socioeconomic status, and geography play in acute and chronic disease. Policies aimed at improving health outcomes in low-income, Black, and Hispanic/Latino communities must be firmly rooted in principles of health equity and community support.

**Authors Contributions** Ms. LB and Ms. RO designed study tools, collected and interpreted data, drafted the manuscript, and critically reviewed the manuscript for important intellectual content. Ms. KMN contributed to design of study tools, oversaw data collection, interpreted data, and reviewed the manuscript. Ms. AR contributed to study design and participant outreach. Mr. JG contributed to study design and participant outreach. Dr. REG oversaw analysis and interpreted results. Dr. JWB conceptualized and designed the study, supervised data collection, interpreted results, and drafted the manuscript. All authors have reviewed and approved the final manuscript.

**Funding** This publication was supported by the National Center for Advancing Translational Sciences, National Institutes of Health, through Grant Number UL1TR001873, formerly the National Center for Research Resources, Grant Number UL1 RR024156. Research reported in this publication was supported by the National Institute of Diabetes And Digestive And Kidney Diseases of the National Institutes of Health under Award Number K23DK115682. Research was also supported by the Doris Duke Charitable Foundation through Grant Number 2018090. This work is solely the responsibility of the authors and does not represent the official views of the NIH or any of the other funders.

**Data Availability** Not applicable.

**Code Availability** Not applicable.

## Declarations

**Conflict of interest** The authors declare that they have no conflict of interest.

**Ethical Approval** The New York City Department of Health and Mental Hygiene (NYC DOHMH) provided conceptual support for this study, and the Institutional Review Boards of Columbia University Medical Center and NYC DOHMH approved all study protocols. This study was therefore been performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki and its later amendments.

**Consent to Participate** All participants gave their informed consent prior to their inclusion in the study.

**Consent for Publication** Not applicable.

## References

- A Foodscape of The South Bronx. (2017). The New York City Food Policy Center at Hunter College. Retrieved May 28, 2020, from [https://www.nycfoodpolicy.org/wp-content/uploads/2017/03/FS10567\\_2017.pdf](https://www.nycfoodpolicy.org/wp-content/uploads/2017/03/FS10567_2017.pdf)
- A Foodscape of Washington Heights/Inwood. (2017). The New York City Food Policy Center at Hunter College. Retrieved May 28, 2020, from [https://www.nycfoodpolicy.org/wp-content/uploads/2016/11/FS301\\_2017.pdf](https://www.nycfoodpolicy.org/wp-content/uploads/2016/11/FS301_2017.pdf)
- Adhikari, S., Pantaleo, N. P., Feldman, J. M., Ogedegbe, O., Thorpe, L., & Troxel, A. B. (2020). Assessment of community-level disparities in coronavirus disease 2019 (COVID-19) infections and deaths in large US Metropolitan Areas. *JAMA Network Open*, 3(7), e2016938. <https://doi.org/10.1001/jamanetworkopen.2020.16938>
- Adjoian, T., & Lent, M. (2017). *Sugary drink consumption among New York City adults, youth and children*. NYC Vital Signs. Retrieved May 11, 2020, from <https://www1.nyc.gov/assets/doh/downloads/pdf/survey/sugary-drink.pdf>
- Asada, Y., Pipito, A. A., Chriqui, J. F., Taher, S., & Powell, L. M. (2021). Oakland's sugar-sweetened beverage tax: Honoring the "spirit" of the ordinance toward equitable implementation. *Health Equity*, 5(1), 35–41. <https://doi.org/10.1089/heq.2020.0079>
- Beekman, D. (2020). *Seattle will provide \$800 each in supermarket vouchers to thousands of families during coronavirus crisis*. The Seattle Times. Retrieved May 11, 2020, from [https://www.seattletimes.com/seattle-news/politics/seattle-will-provide-800-in-supermarket-vouchers-to-thousands-of-families-during-coronavirus-crisis/?utm\\_medium=social&utm\\_campaign=owned\\_echobox\\_f&utm\\_source=Facebook&fbclid=IwAR1011c9AKJt0qkiffiW-SjdZ2-odOBKnhEwcWAYXxD12yuU9yhdynaPSEs#Echobox=1584396896](https://www.seattletimes.com/seattle-news/politics/seattle-will-provide-800-in-supermarket-vouchers-to-thousands-of-families-during-coronavirus-crisis/?utm_medium=social&utm_campaign=owned_echobox_f&utm_source=Facebook&fbclid=IwAR1011c9AKJt0qkiffiW-SjdZ2-odOBKnhEwcWAYXxD12yuU9yhdynaPSEs#Echobox=1584396896)
- Blake-Lamb, T. L., Locks, L. M., Perkins, M. E., Woo Baidal, J. A., Cheng, E. R., & Taveras, E. M. (2016). Interventions for childhood obesity in the first 1000 days a systematic review. *American Journal of Preventive Medicine*, 50(6), 780–789. <https://doi.org/10.1016/j.amepre.2015.11.010>
- Bleich, S. N., Lawman, H. G., LeVasseur, M. T., Yan, J., Mitra, N., Lowery, C. M., Peterhans, A., Hua, S., Gibson, L. A., & Roberto, C. A. (2020). The association of a sweetened beverage tax with changes in beverage prices and purchases at independent stores. *Health Affairs*, 39(7), 1130–1139. <https://doi.org/10.1377/hlthaff.2019.01058>
- Borkan, J. (1999). Immersion/crystallization. In B. F. Crabtree & W. L. Miller (Eds.), *Doing qualitative research* (2nd ed., pp. 179–194). Sage.
- Branscum, P., & Sharma, M. (2011). A systematic analysis of childhood obesity prevention interventions targeting Hispanic children: Lessons learned from the previous decade. *Obesity Reviews*, 12(5), e151–e158. <https://doi.org/10.1111/j.1467-789x.2010.00809.x>
- Brief: Cost-Effectiveness of a Sugar-Sweetened Beverage Tax in Seattle, WA. (2018). CHOICES Project. <https://choicesproject.org/publications/brief-cost-effectiveness-of-a-sugar-sweetened-beverage-tax-seattle-wa/>
- Colchero, M. A., Rivera-Dommarco, J., Popkin, B. M., & Ng, S. W. (2017). In Mexico, evidence of sustained consumer response two years after implementing a sugar-sweetened beverage tax. *Health Affairs*, 36(3), 564–571. <https://doi.org/10.1377/hlthaff.2016.1231>
- Community Health Profiles. (2019). NYC Health. Retrieved September 4, 2021, from <https://a816-health.nyc.gov/hdi/profiles/>
- Crabtree, B., & Miller, W. (1999). Using codes and code manuals: A template organizing style of interpretation. In B. Crabtree & W.

- Miller (Eds.), *Doing qualitative research* (2nd ed., pp. 163–177). Sage Publications.
- Dowling, E. A., Roberts, C., Adjoian, T., Farley, S. M., & Dannefer, R. (2020). Disparities in sugary drink advertising on New York City streets. *American Journal of Preventive Medicine*, 58(3), e87–e95. <https://doi.org/10.1016/j.amepre.2019.09.025>
- Falbe, J., Grummon, A. H., Rojas, N., Ryan-Ibarra, S., Silver, L. D., & Madsen, K. A. (2020). Implementation of the first US sugar-sweetened beverage tax in Berkeley, CA, 2015–2019. *American Journal of Public Health*, 110(9), 1429–1437. <https://doi.org/10.2105/AJPH.2020.305795>
- Falbe, J., Thompson, H. R., Patel, A., & Madsen, K. A. (2019). Potentially addictive properties of sugar-sweetened beverages among adolescents. *Appetite*, 133, 130–137. <https://doi.org/10.1016/j.appet.2018.10.032>
- Fredrick, J. (2020). *Mexican States ban sale of junk food to minors*. National Public Radio. Retrieved May 11, 2020, from <https://choice.npr.org/index.html?origin=https://www.npr.org/2020/09/05/909969074/mexico-bans-sale-of-junk-food-to-minors>
- Gee, G. C. (2008). A multilevel analysis of the relationship between institutional and individual racial discrimination and health status. *American Journal of Public Health*. [https://doi.org/10.2105/ajph.98.supplement\\_1.s48](https://doi.org/10.2105/ajph.98.supplement_1.s48)
- Gillman, M. W., Rifas-Shiman, S. L., Fernandez-Barres, S., Kleinman, K., Taveras, E. M., & Oken, E. (2017). Beverage intake during pregnancy and childhood adiposity. *Pediatrics*, 140(2), e20170031. <https://doi.org/10.1542/peds.2017-0031>
- Glass, T. A., & McAtee, M. J. (2006). Behavioral science at the crossroads in public health: Extending horizons, envisioning the future. *Social Science and Medicine*, 62(7), 1650–1671. <https://doi.org/10.1016/j.socscimed.2005.08.044>
- Grumbach, K., Vargas, R. A., Fleisher, P., Aragón, T. J., Chung, L., Chawla, C., et al. (2017). Achieving Health equity through community engagement in translating evidence to policy: The San Francisco health improvement partnership, 2010–2016. *Preventing Chronic Disease*, 14, 160469. <https://doi.org/10.5888/pcd14.160469>
- Jou, J., Niederdeppe, J., Barry, C. L., & Gollust, S. E. (2014). Strategic messaging to promote taxation of sugar-sweetened beverages: Lessons from recent political campaigns. *American Journal of Public Health*, 104(5), 847–853. <https://doi.org/10.2105/ajph.2013.301679>
- Kaltenbrun, T. A., du Plessis, L. M., & Drimie, S. (2020). A qualitative analysis of perceptions of various stakeholders on nutrition-sensitive agricultural interventions, including the taxation on sugar-sweetened beverages (SSBs), to improve overall health and nutrition in South Africa. *BMC Public Health*, 20, 1342. <https://doi.org/10.1186/s12889-020-09440-8>
- Muth, N. D., Dietz, W. H., Magge, S. N., & Johnson, R. K. (2019). Public policies to reduce sugary drink consumption in children and adolescents. *Pediatrics*, 143(4), e20190282. <https://doi.org/10.1542/peds.2019-0282>
- Pan, L., Li, R., Park, S., Galuska, D. A., Sherry, B., & Freedman, D. S. (2014). A longitudinal analysis of sugar-sweetened beverage intake in infancy and obesity at 6 years. *Pediatrics*, 134(Supplement), S29–S35. <https://doi.org/10.1542/peds.2014-0646f>
- Powell, L. M., & Leider, J. (2020). The impact of Seattle’s sweetened beverage tax on beverage prices and volume sold. *Economics and Human Biology*, 37, 100856. <https://doi.org/10.1016/j.ehb.2020.100856>
- Roberto, C. A., Lawman, H. G., LeVasseur, M. T., Mitra, N., Peterhans, A., Herring, B., & Bleich, S. N. (2019). Association of a beverage tax on sugar-sweetened and artificially sweetened beverages with changes in beverage prices and sales at chain retailers in a large urban setting. *JAMA*, 321(18), 1799. <https://doi.org/10.1001/jama.2019.4249>
- Schonfeld, R. C., & Sweeney, L. (2018). *Diversity in the New York City Department of Cultural Affairs Community*. S+R Ithaka. Retrieved May 11, 2020, from <https://sr.ithaka.org/publications/diversity-in-the-new-york-city-department-of-cultural-affairs-community/>
- Shop Healthy - NYC Health. (2013). NYC Health. Retrieved May 25, 2020, from <https://www1.nyc.gov/site/doh/health/neighborhood-health/shop-health.page>
- Taylor, R. L. C., Kaplan, S., Villas-Boas, S. B., & Jung, K. (2019). Soda wars: The effect of a soda tax election on university beverage sales. *Economic Inquiry*, 57(3), 1480–1496. <https://doi.org/10.1111/ecin.12776>
- Webb Hooper, M., Nápoles, A. M., & Pérez-Stable, E. J. (2020). COVID-19 and Racial/Ethnic disparities. *JAMA*, 323(24), 2466. <https://doi.org/10.1001/jama.2020.8598>
- Woo Baidal, J. A., Locks, L. M., Cheng, E. R., Blake-Lamb, T. L., Perkins, M. E., & Taveras, E. M. (2016). Risk factors for childhood obesity in the first 1000 days. *American Journal of Preventive Medicine*, 50(6), 761–779. <https://doi.org/10.1016/j.amepre.2015.11.012>
- Yan, K. (2020). *COVID-19 relief in Seattle will be funded by soda tax revenues*. DiaTribe. Retrieved May 11, 2020, from <https://diatribe.org/covid-19-relief-seattle-will-be-funded-soda-tax-revenues>
- Yang, Y. T., & Benjamin-Neelon, S. E. (2019). Recent progress in children’s meals law in restaurants in Baltimore City and California State: Making a healthy beverage option the default choice. *Preventive Medicine*, 123, 160–162. <https://doi.org/10.1016/j.ypmed.2019.03.031>
- Yi, S. S., Ruff, R. R., Jung, M., & Waddell, E. N. (2014). Racial/ethnic residential segregation, neighborhood poverty and urinary biomarkers of diet in New York City adults. *Social Science and Medicine*, 122, 122–129. <https://doi.org/10.1016/j.socscimed.2014.10.030>

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

## Authors and Affiliations

Lucy Braid<sup>1,2</sup> · Rocío Oliva<sup>1,3,4</sup> · Kelsey Nichols<sup>1</sup> · Anita Reyes<sup>5</sup> · Jairo Guzman<sup>6</sup> · Roberta E. Goldman<sup>3</sup> · Jennifer A. Woo Baidal<sup>1</sup>

Lucy Braid  
lucy\_braid@berkeley.edu

Rocío Oliva  
rocio\_oliva@brown.edu

Kelsey Nichols  
kmn2139@cumc.columbia.edu

Anita Reyes  
areyes@health.nyc.gov

Jairo Guzman  
jguzman@coalicionmexicana.org

Roberta E. Goldman  
Roberta\_goldman@brown.edu

- <sup>1</sup> Division of Pediatric Gastroenterology, Hepatology, and Nutrition, Department of Pediatrics, Columbia University Irving Medical Center, 622 W. 168th Street, New York, NY 10032, USA
- <sup>2</sup> UC Berkeley School of Public Health, 2121 Berkeley Way, Berkeley, CA, USA

- <sup>3</sup> The Warren Alpert Medical School, Brown University, 222 Richmond St, Providence, RI, USA
- <sup>4</sup> Institute of Human Nutrition, Columbia University Medical Center, 630 W. 168th Street, New York, NY, USA
- <sup>5</sup> New York City Department of Health and Mental Hygiene, Center for Bronx Health Equity, New York, NY, USA
- <sup>6</sup> Coalición Mexicana (Mexican Coalition), Bronx, NY, USA