



Contents lists available at ScienceDirect

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journal homepage: [www.elsevier.com/locate/pateducou](http://www.elsevier.com/locate/pateducou)



# The critical role of communications in a multilevel obesity-prevention intervention: Lessons learned for alcohol educators

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### ARTICLE INFO

#### Article history:

Received 21 August 2015

Received in revised form 12 January 2016

Accepted 15 January 2016

#### Keywords:

Communication

Community-based participatory research

Obesity

Health promotion

Social marketing

Alcohol consumption

### ABSTRACT

**Objective:** Multilevel interventions to prevent underage drinking are more effective than individual-level strategies, and messaging campaigns are key to such approaches. Recognizing the benefits of translating best practices across public health domains, this paper details the communications campaign from Shape Up Somerville (SUS), an exemplar for multilevel community-based approaches to address pediatric obesity, highlighting lessons learned for alcohol educators.

**Methods:** All elements of SUS, including the communications strategy, were developed collaboratively with local partners. Communication initiatives included community-engaged brand development to unify diverse intervention components; school-based communications to promote new opportunities for healthy eating and physical activity; and media partnerships to promote healthy behaviors community-wide.

**Results:** The overall SUS intervention was effective in reducing prevalence of overweight/obesity among first- to third-graders in Somerville relative to control communities. Process evaluation showed that communications successfully reached diverse community segments and raised awareness of and receptivity to changes.

**Conclusions and practice implications:** Communications campaigns are essential components of multilevel interventions addressing public health challenges including obesity and underage drinking. Such communications should be developed collaboratively with the target audience and stakeholders, designed to engage community members at multiple levels through multiple channels within a systems framework, and sustained through local partnerships.

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## 1. Introduction

### 1.1. Underage drinking in the United States

Underage drinking is a major public health concern in the United States [1]. Although purchase and possession of alcoholic beverages by individuals under age 21 is illegal in all 50 U.S. states, alcohol consumption among minors is commonplace. For example, among high school students responding to the 2013 Youth Risk

Behavior Survey, 35% reported drinking some alcohol and 21% reported binge drinking in the prior 30 days [2]. The consequences of underage drinking include absences at school and poor academic performance; social disengagement; unwanted sexual activity; legal problems, including arrests for drunk driving; changes in brain function and cognitive deficits; disruption of normal physical growth and development; and risk of injury and death [1,3]. Decreasing underage drinking was identified as a key public health priority in Healthy People 2020 [4].

While interventions to prevent underage drinking have had limited success overall, review studies and major policy reports have suggested that multilevel, whole-of-community models—which address not just individual-level behavior modification but also social, physical, and policy environments—show greater promise than those that target only individual youth or their families [5,6]. Such findings are consistent with social-ecological models of behavior change, which stress the importance of

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<sup>1</sup> Dr. Sliwa contributed to this article in her private capacity. No official support or endorsement by the Centers for Disease Control and Prevention, Department of Health and Human Services is intended nor should be inferred.

environmental determinants of health behaviors [7]. Multilevel approaches have also been recommended to address other public health challenges, including pediatric obesity. For example, in its 2012 consensus report of evidence-based recommendations for slowing or reversing obesity rates, the Institute of Medicine (IOM) promoted multilevel changes including schools, worksites/health-care settings, food/beverage and physical activity environments, and messaging environments [8].

1.2. Translating strategies across public health domains

Past and ongoing studies on the effectiveness of multilevel approaches to prevent underage drinking and other substance-abuse concerns provide important insight to inform future public health practice [6,9]. However, there is also tremendous potential in identifying and translating best practices from other public health contexts [10]. Evidence suggests that successful strategies may be particularly transferable between substance-abuse-prevention and obesity-prevention domains [11], in part due to their common challenges and priorities. For example, both alcohol abuse and obesity involve complex interactions among individual/biological and environmental factors; underage drinking and eating and physical activity behaviors are influenced by powerful social norms, which are themselves shaped by commercial marketing; and alcohol and food have potential addictive properties and are sometimes used as coping mechanisms. Furthermore, both alcohol educators and obesity-prevention leaders target young people as a particularly high-priority population. While alcohol-education efforts often are not initiated until adolescence or early adulthood, observational studies have found that childhood exposures (e.g., sipping alcohol or being exposed to alcohol advertising) are associated with subsequent underage drinking [12]. Intervention research has shown that education for elementary-aged children (e.g., media literacy training related to alcohol advertisements) may help prevent later substance abuse [13].

Recognizing the potential for transdisciplinary exchange of best practices, another paper in this supplement discusses lessons learned from three obesity-prevention interventions and their

implications for alcohol educators [14]. This paper expands on one of those case examples, Shape Up Somerville (SUS), a multilevel environmental-change intervention that has been cited by the IOM and others as an exemplar for systems-based obesity-prevention work [8,15–17]. In particular, it explores in depth the communications campaign that played a critical role in promoting uptake of healthy nutrition and physical activity behaviors enabled by other changes to the community’s physical and policy environments. For both alcohol educators and obesity-prevention interventionists, mutual reinforcement between communications and other environmental changes is critical: messaging can promote responsiveness to changes to physical/policy environments (e.g., increased availability of fruit/vegetable or alcohol-free activity options), and environmental supports are critical for messaging campaigns to shift not only intentions but also behavior [18,19].

This case study [20] highlights key principles for developing and implementing successful communications campaigns in the context of multilevel interventions to address obesity, underage drinking, or other public-health challenges. These principles include ensuring alignment between messaging and other environmental supports, tailoring messages based on formative research with the target audience and key stakeholders, reaching community members at multiple levels through multiple channels, and building local partnerships that can support and sustain communications efforts. While there have been substantial changes in the channels used for health communication in the intervening decade since the SUS campaign was designed, these principles remain consistent with more recent recommendations for health communication campaigns [21] and have been applied in campaigns using contemporary channels like social media [22].

2. Methods

2.1. Intervention context and overview

The overall purpose of Shape Up Somerville (SUS), a quasi-experimental study, was to prevent undesirable weight gain among first- to third-graders in Somerville, Massachusetts. To evaluate this outcome, BMI z-scores were measured in children in

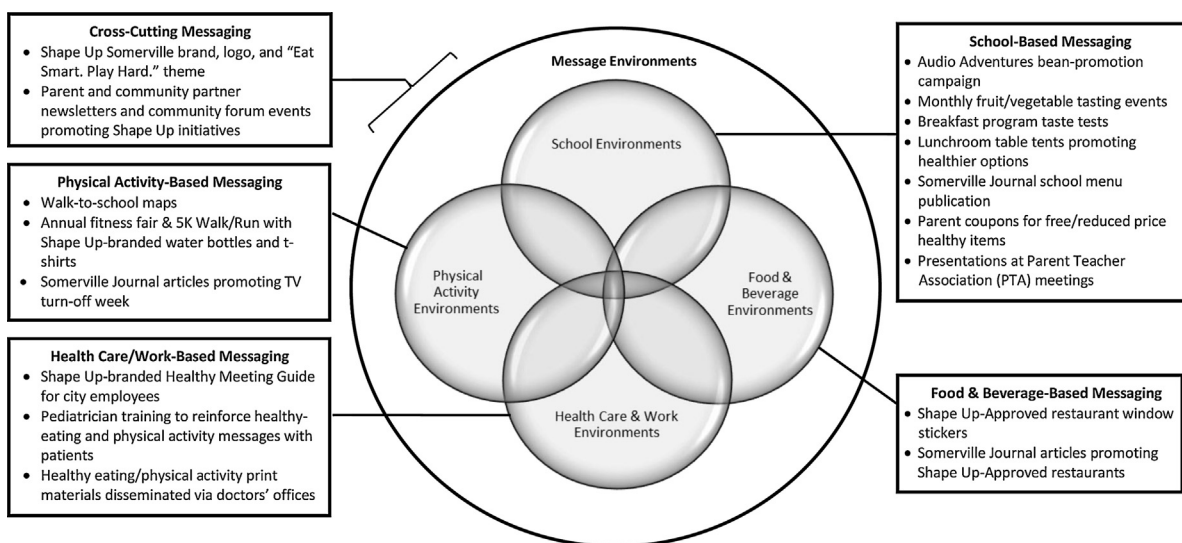


Fig. 1. Overview of Shape Up Somerville’s multilevel communications strategy to promote healthy eating and physical activity, Somerville, Massachusetts, 2003–2005. Note: Framework adapted with permission from *Accelerating Progress in Obesity Prevention: Solving the Weight of the Nation*, 2012, by the National Academy of Sciences, Courtesy of the National Academies Press, Washington, D.C.

The Shape Up Somerville communications campaign, designed with community partners during a one-year planning period prior to the intervention’s launch, permeated multiple environments, promoting healthy changes in physical settings (e.g., healthier school foods). Here, the components are set within a systems framework to highlight their interconnectedness and mutual reinforcement.

Somerville and two control communities in 2003–2005. Previous publications described overall policy and environmental-change components of SUS [23–26] and SUS initiatives that were sustained or extended [27,28]. However, these papers have not described SUS's communications model as an integrated campaign.

2.2. The SUS communications campaign

The specific objective of the SUS communications campaign was to increase awareness and promote uptake of new opportunities for healthy eating and physical activity among elementary-age Somerville children and their families. Children and stakeholders from the community were actively engaged in developing the communications plan to ensure messages aligned with local priorities and delivery channels reached diverse population segments. Similar participatory approaches have been found promising for interventions to reduce underage drinking [9,29,30].

Fig. 1 shows the overall components of SUS's communications campaign. More important than the particular media themselves is the multi-channel, multi-context nature of the campaign: rather than delivering messages in a single environment through a single communication channel, the campaign spanned a variety of settings (e.g., schools, healthcare settings, restaurants) and

multiple channels (e.g., newsletters, television, newspapers). These messages were specifically designed to promote changes to physical environments that influenced children's physical activity or dietary behaviors. For example, school-based communications primed children to be responsive to new, healthier school foods [25]. Other communications efforts were similarly designed to promote community-wide food/physical activity-oriented initiatives, such as the "SUS-approved" healthy restaurant program, a farmers' market initiative, and implementation of bike racks and thermoplastic crosswalks city-wide. In addition to schools and the children who attend them, the communications plan engaged families and the broader Somerville population, who could support children's health behaviors and benefit from community-wide initiatives themselves. The Tufts University Institutional Review Board approved the SUS study protocol, including communications components.

2.2.1. Building a cohesive, community-relevant brand

Developing an overall SUS brand identity and intervention theme was important to ensure communications reinforced common, well-defined behavioral objectives and promoted a brand relationship between SUS and Somerville residents. Such brand consistency is critical to the success of public health

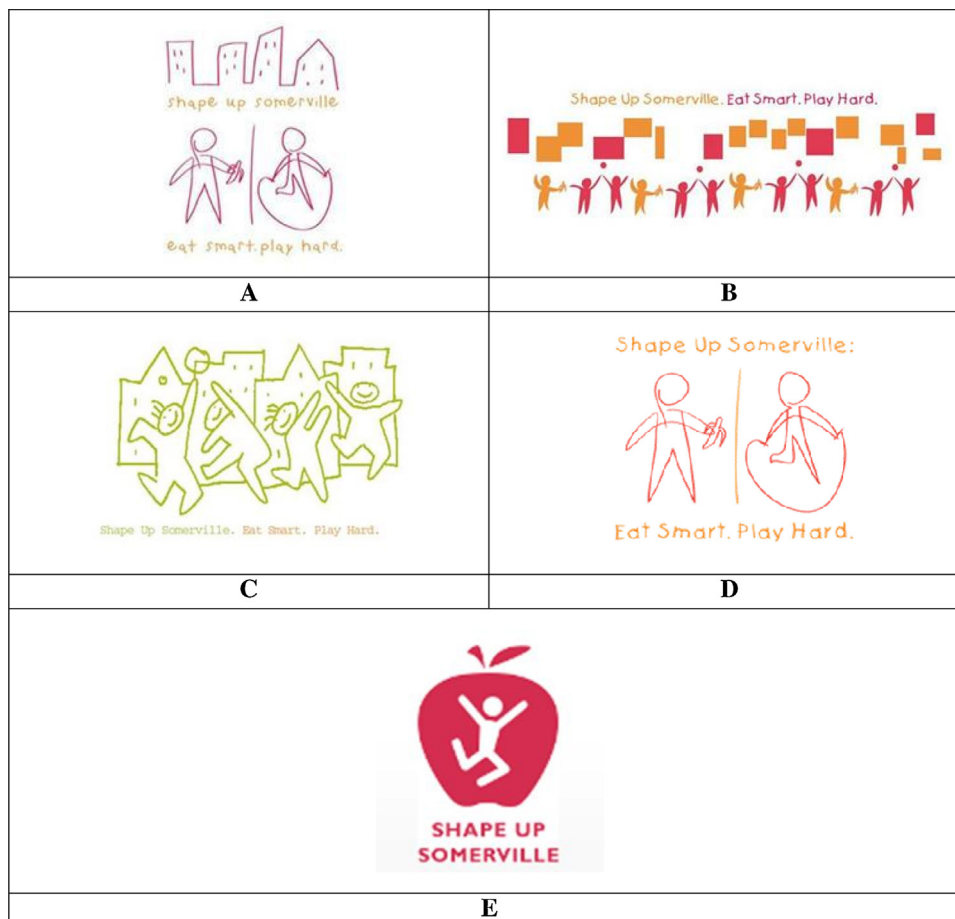


Fig. 2. Shape Up Somerville logos tested in focus groups (A–C), final logo design (D), and a new, age-neutral logo developed after the program was transitioned to the City of Somerville (E).

Note: Fig. 2(E) printed with permission from City of Somerville Health Department.

A local graphic designer created several logo concepts to capture the "Eat Smart. Play Hard." intervention theme, which was informed by ideas from local children. All logo concepts depicted children with neutral body shapes and racial-ethnic identities. Somerville parents, children, foodservice employees, and Shape Up Somerville project staff voted for their favorite logo, which was refined based on feedback from community members. During the intervention, materials were consistently branded with the logo to help unify diverse components. After the initial intervention period, the City of Somerville and community stakeholders assumed leadership of Shape Up Somerville and expanded its primary scope from schoolchildren to community members of all ages. The new logo they developed communicated the "Eat Smart. Play Hard." theme using an age-neutral figure.

campaigns targeting a range of health behaviors, including underage drinking [31].

Traditional top-down approaches to branding public-health campaigns are often unsuccessful in engaging the target audience [32]. Rather than taking such a top-down approach, SUS developed its brand concept during a yearlong, community-engaged planning stage. A contest with Somerville elementary schoolchildren generated the name “Shape Up Somerville” and potential intervention themes. Informed by these proposed themes, SUS staff refined the central brand message to “Eat Smart. Play Hard,” which distilled the intervention’s overarching goals into two directives that unified SUS’s programmatic components and anchored the communications strategy to a consistent health message. Importantly, neither the brand message nor more general communications explicitly mentioned obesity or weight. Such positive framing helped to ensure messaging was non-stigmatizing. This framing may also have enhanced the campaign’s effectiveness, given evidence that positively framed messages have a more favorable influence on health behaviors compared with negatively framed messages [33].

Once the brand concept had been established, a local graphic designer was hired to help communicate the “Eat Smart. Play Hard.” theme through logo concepts, which were tested with community members. Fig. 2(a)–(c) shows several prototypes. All designs depicted playing children, without particular body shapes or racial/ethnic identities to maximize resonance across population subgroups. Parents, children, and foodservice staff in Somerville public schools provided comments and voted on designs at school breakfasts and parent coffee hours. Further refinements were made to the graphic chosen by community members and project staff. The final logo (Fig. 2d) represented the “Eat Smart” message with a child eating a banana, a kid-friendly, low-cost, healthy, and convenient food. The “Play Hard” side showed a child jumping rope, highlighting fun, non-competitive, low-cost physical activity. Communications campaigns in other public health domains may benefit from similar community-engaged brand-development processes that unify campaign components around a cohesive theme.

To enhance brand cohesion for the SUS communications campaign and the intervention generally, the SUS name and logo were used on project communications across multiple environments. For example, the logo was applied to family newsletters, banners at city-wide celebrations, and Healthy Meeting Guides distributed to municipal departments; SUS-branded water bottles and t-shirts were distributed at walk/run events; SUS reflective tags were disseminated for Walk-to-School Day; and branded window stickers identified SUS-approved restaurants.

To remain fresh and relevant, public health campaign brands—like those of commercial brands—must be dynamic. In light of this imperative, following the initial intervention period (2002–2005), rights to the SUS logo were transferred to the City of Somerville and SUS Task Force, composed of community stakeholders, as part of SUS’s sustainability plan. Whereas the Tufts Shape Up intervention had principally prioritized first- through third-graders, the Task Force expanded SUS’s scope to engage all community members and developed a new logo (Fig. 2(e)) that represented the “Eat Smart. Play Hard.” theme using an age-neutral figure [34]. This logo is still being used to promote SUS activities.

### 2.2.2. Tailoring school-based communications

The IOM has emphasized that educational institutions should be a focal point for prevention of both obesity [8] and underage-drinking [5]. Given its primary focus on first- through third-graders, SUS included numerous school-based initiatives to expand opportunities for healthy eating and physical activity [25] and, to promote these new opportunities, saturated school

environments with messages reinforcing SUS’s theme. Multilevel communications strategies may be particularly critical for campaigns targeting behaviors like diet/physical activity and underage drinking, given the extent to which young people are exposed to and influenced by counter-messages through commercial advertising (e.g., advertisements for junk foods or alcoholic beverages) [35,36]. For alcohol educators, school-based interventions integrating changes to physical environments (e.g., late-night alcohol-free events) and corresponding multichannel communications campaigns may be most relevant for high-school and college campuses [37,38]. Although the types of messages and communication channels used in SUS were appropriate to elementary-aged children, the broad strategies employed in their design and implementation (e.g., aligning messaging with changes to school physical environments and tailoring communications based on formative research) are likewise relevant to campaigns targeting adolescents and young adults.

Like other elements of the SUS campaign, school-based communications plans were developed collaboratively with stakeholders during SUS’s planning year. For example, during one planning meeting, 14 stakeholders, including a school principal, secretary, nurses, a school council member, and community- and public-health workers, discussed opportunities to promote healthy eating and physical activity in schools and voted on messaging strategies. Individual elementary schools subsequently adopted messaging strategies that best suited school-specific needs and resources.

The Bean Project was a targeted social marketing campaign focused on developing and promoting school lunch entrees containing bean legumes [39]. A promotional campaign including 11 segments (collectively called Audio Adventures) was developed for delivery through school public-address systems. These segments were grounded in analysis of corporate food-marketing strategies in children’s television and leveraged these same strategies to promote healthy options. Based on that analysis, segments were designed to express common advertising themes including “fun/good times,” “feelings of happiness,” “friendship,” and “magical/superhuman abilities” [40]. The episodes featured the adventures of a superhero called Bean Man, included a consistent tagline, and starred Somerville elementary student-actors. Messages were pilot-tested with students at schools not participating in the Audio Adventures intervention. They were then broadcast in three randomly selected intervention schools. A prior paper described the design and evaluation of the Bean Project in detail [39].

Process and outcome evaluation methods were used to test the impact of school-based communications. In the Audio Adventures campaign, implementation was monitored using structured checklists completed by office employees responsible for playing messages. Children’s selection of bean-based dishes versus a competing hot-dog option was monitored in intervention and control schools via direct observation [39]. To determine whether the proportion of children participating in school meals changed after healthier items were added, participation rates in the school breakfast and school lunch programs were obtained from school foodservice departments and compared for September 2003 versus October 2004.

Future research might explore a parallel approach of leveraging strategies from alcohol marketing to inform a campaign to prevent underage drinking; to our knowledge, no prior studies have tested this approach.

### 2.2.3. Reaching community members

Public health campaigns—whether they target diet and physical activity, underage drinking, or other health behaviors—face competing priorities of reaching broad segments of the population

and being sufficiently tailored to subgroups. Recognizing this tension, SUS developed various community-level messaging strategies, some with broad reach and others crafted for specific subpopulations (Table 1). Interviews with 19 key informants during the planning year helped to identify communications channels relevant to families of Somerville children. Key informants included school committee members; staff from the public library, health department, and other city departments; and directors of local service-providing organizations like the Family Network and Massachusetts Association of Portuguese Speakers.

Recognizing that local news outlets can help promote public-health initiatives [8], and the more general importance of mass media in public agenda-settings [41], SUS collaborated with the largest local newspaper, the Somerville Journal, which several key informants identified as a reputable source among their constituents. SUS staff approached the Journal's editorial board with article concepts intended for a broad, primarily adult audience that could promote SUS messages and model health behaviors. Written by SUS staff, articles provided the Journal a low-cost opportunity to present itself as closely invested in community health. During the intervention, monthly articles highlighting local opportunities for healthy eating and/or physical activity were published. Some promoted upcoming events, like community forums or traffic-calming campaigns around school zones, while others emphasized the importance of adults' role-modeling healthy behaviors.

Identifying influential opinion leaders through formative research and engaging them in communications campaigns can be a powerful strategy for public health promotion, particularly given that, as diffusion theory suggests, messages delivered through such leaders may be more effective than messages delivered directly to the target audience [42]. For the Somerville Journal articles, SUS staff engaged Somerville Mayor Joseph Curtatone. The "Where's Joe" article series chronicled Curtatone's involvement in SUS activities, such as dining at SUS-approved restaurants and reading to elementary schoolchildren during TV turn-off week. Given the importance of repeated message exposure to advance behavior change, SUS staff layered local news efforts with other communications. For example, SUS-approved restaurants were publicized through the Somerville Journal, a Healthy Meeting Guide for city employees, promotion of SUS-approved restaurants at the SUS 5K walk/run, and a marketing initiative identifying participating businesses with SUS-branded window stickers [23].

In developing communications campaigns to address underage drinking, obesity, or other public health concerns, practitioners must take particular care to reach population subgroups, particularly those disproportionately affected by the concern at hand [43]. In that vein, SUS researchers recognized that, despite the Journal's relatively large circulation, it was available only in English through paid subscription. Interviews with leaders from organizations serving immigrant and minority communities revealed their constituents did not read Somerville newspapers. Because newspaper-based communication likely missed subpopulations, SUS worked with key informants from community partner organizations to identify additional channels to reach

these populations where they were already engaged. SUS staff developed 6 community newsletters that were translated into Spanish, Brazilian Portuguese, and Haitian Creole and disseminated through community partners. SUS staff also engaged in direct outreach through community forums (where translators were present and childcare was provided), participated in community events and celebrations, and promoted SUS in news segments and in a panel discussion on the Somerville Community Access Television (SCAT) network.

Parents also play a key role in children's health behaviors, including diet/physical activity behaviors and underage drinking [44,45]. In SUS, a variety of communications specifically targeted parents of school-aged children and aimed to bring consistent messaging about healthy eating and physical activity into the home environment. For example, bi-monthly newsletters provided information about upcoming SUS events at school and in the community plus healthy recipes and informational articles about nutrition and physical activity.

Following the first intervention year, key-informant interviews with 13 community leaders evaluated the effectiveness of community-wide interventions and communications. Many of these key informants had participated in planning year activities. Parent surveys were also sent to the homes of 631 Somerville children in grades 1–3 whose parents had consented to their participation in the intervention [24]. Surveys were translated into Spanish, Portuguese, and Haitian Creole and included questions about parental awareness of different communication and intervention components, including newsletters, articles in the Somerville Journal, and changes made to school meals.

### 3. Results

SUS's main outcome evaluation found that the overall intervention decreased BMI z-scores among first- through third-grade children in the intervention community relative to control communities [24,46]. Data collected through process evaluation, key-informant interviews, and school-staff and parent surveys suggested that the SUS branding and communication efforts reached a high proportion of the target audience and helped motivate behavior change.

#### 3.1. Results of school-based communications

Evaluation of school meals participation data showed that from September 2003 to October 2004 participation in school breakfast increased from 24% to 27% of students and participation in lunch increased from 55% to 58% of students. School-based messaging efforts may have helped promote participation in school meals even after healthier items were adopted.

Evaluation of the Audio Adventures campaign found that implementation varied somewhat. In the school with highest compliance, staff played messages daily in the intervention period's final six weeks. With this concentrated dose, students were 2.5 times more likely to choose bean dishes over a competing hot dog option than were students in a paired control school,

**Table 1**  
Characteristics of Shape-Up Somerville's community-level communications initiatives, as assessed by project staff and key informants.

Strategy	Financial cost	Time cost	Reach	Ability to tailor	Perceived effectiveness <sup>a</sup>
Newspaper column	Low	Moderate	High	Low	Moderate (8/13)
Community events	Varied	High	Moderate	High	High (10/13)
Community forums	Moderate	High	Low	High	Moderate (7/13)
Community newsletters	Low	Moderate	High	Moderate	Moderate (9/13)
Community access television	Low	Low	Low	Low	Low (2/13)

<sup>a</sup> Based on key informant interviews; numbers in parentheses indicate the proportion of informants reporting that the communication was effective.

where no messages were played [39]. Compliance was lower and more sporadic in two other intervention schools, where children were no more likely to choose bean dishes compared with controls. Closer monitoring, accountability, and support for compliance might have improved impact in all intervention schools. Once the Bean Project was concluded and the messages over the public address system were discontinued, beans remained on the school lunch menu, suggesting the campaign generated sufficient student demand.

### 3.2. Results of community-level communications

Process evaluation suggested that parent-focused messages reached many families and raised awareness of SUS initiatives. In parent/guardian surveys administered at the end of SUS's first intervention year, 91% of respondents reported reading parent newsletters "sometimes" or "always." Most respondents indicated they were aware that more fresh produce was offered in schools (54%) and that cafeterias were selling healthful snacks (52%) [25]. Although awareness was high among survey participants, the low response rate (34%) suggests that there may have been a core of engaged parents who completed surveys and had high awareness [25]. We are unable to determine how well these responses represent the sentiments of all families reached through the parent newsletters. The parent survey data also showed that approximately one-third (34%) of respondents did not read the Somerville Journal, confirming the value of having numerous communications channels throughout the community.

Table 1 shows costs associated with different community-level communications efforts, their reach and level of tailoring to local constituents, and overall effectiveness as assessed by key informants. The community newsletter reached 353 community partners, and most key informants (9/13) said they found these newsletters useful. Eight of 13 key informants reported having heard of SUS-Approved Restaurants, potentially reflecting the impact of the restaurant-focused promotional efforts. In all, 11 Somerville Journal pieces reached over 20,000 subscribers each month [24]. Most key informants also indicated that Journal columns, community events, and community forums were effective means of outreach. Communications delivered through segments on SCAT, the local community access channel, were less fruitful. In interviews during intervention development, only one of 18 key informants had identified SCAT as a source of information for residents. Despite this evidence, SUS proceeded with the low-cost SCAT news segments. In retrospect, even the limited effort required to produce these segments was not justified by the low return on investment: in post-intervention interviews, only 2/13 community leaders said they had noticed SCAT messages. Closer attention to formative research may have led to reallocation of these resources to other communication channels.

## 4. Discussion and conclusion

### 4.1. Discussion

There is growing recognition that public health initiatives targeting a wide range of issues, including pediatric obesity and underage drinking, are most effective when they combine multilevel environmental changes with corresponding promotional messaging. This paper provides a retrospective case study describing how communications strategies were integrated with environmental changes in SUS, one of few interventions that have successfully reduced community-level pediatric obesity rates.

From the SUS experience, we draw several key lessons for researchers and interventionists seeking to develop communications campaigns as a component of community-engaged

environmental interventions. While SUS specifically aimed to address pediatric obesity, these broad lessons are applicable for other types of community-health interventions, including those targeting underage drinking:

- Campaign messages and corresponding environmental changes must be aligned and mutually reinforcing. In this case, SUS's communications efforts were designed to promote specific changes in the physical environment that enabled community members to "Eat Smart. Play Hard." In the case of underage drinking prevention, tailored communications should promote existing environmental supports, such as increased access to alternatives to drinking and limited opportunities to possess/purchase alcohol as a minor.
- Communications must be grounded in comprehensive formative research, including active collaboration with local partners, to inform message tailoring. Time required for formative research—and incorporation of insights generated—should be included in project planning and budgeting. In SUS, for example, the Bean Man "Audio Adventures" segments were informed by content analysis of child-targeted food marketing as well as focus groups with local children. Similar approaches may be especially relevant to the prevention of underage drinking given the importance of marketing and social influences on alcohol use among young people [35,47–49].
- Messaging should reinforce efforts at multiple levels within a whole-systems framework, saturating the environment through diverse channels. In SUS, communications reached not only children but also other stakeholders in schools, homes, and the community. To reach these diverse audiences required varied messages and diverse channels developed/identified in collaboration with community stakeholders. A parallel example can be found in Project Northland, a community wide intervention to prevent alcohol use among adolescents. Among other intervention components, the project incorporated communications for parents, children at different grade levels, and community coalitions [47,48,50].
- Local alliances can strengthen communications campaigns. SUS engaged local media and thought leaders in win-win partnerships at limited cost. Media advocacy can play an important role in elevating community awareness of a public health problem and increasing community readiness to act and support intervention strategies [10,51–53]. Local partnerships may also enhance program sustainability. For example, after initially being engaged through the "Where's Joe" media effort, Mayor Curtatone continued to champion healthy eating and physical activity policies in Somerville and advocated for systems-based approaches to address obesity nationally.

We recognize limitations in this discussion of SUS's communications campaign. Because the messaging strategy was just one component of a larger environmental intervention, it is difficult to parse out the effects of communications specifically. Fuller investment in gathering process data related to messaging may have provided additional insight into the impact of SUS's communications components. Over ten years have passed since SUS was launched, and the media landscape has since changed dramatically. Social media in particular presents a new frontier for carefully targeted messaging. Nevertheless, overarching concepts outlined in this paper are transferable across media. In fact, SUS investigators have applied these lessons in a more recent obesity-prevention initiative, ChildObesity180. Rooted in extensive formative research with stakeholders ranging from local scout-troop leaders to global food-industry leaders [54], this initiative combines broad-scale changes to food and physical activity environments with multichannel promotional messaging

delivered through contemporary media like YouTube, Facebook, and Twitter ([www.childobesity180.org](http://www.childobesity180.org)). Further research in such initiatives, including rigorous process and outcome evaluation, will advance our understanding of the critical role of communications in multilevel interventions.

#### 4.2. Conclusions and practice implications

The SUS communications campaign saturated the Somerville community with health-promoting messaging and successfully raised awareness of and responsiveness to changes in the local food and physical activity environments. Lessons learned from this campaign are transferrable to other multilevel public-health interventions, including those targeting underage drinking. In particular, SUS's experience highlights that communications should be developed collaboratively with stakeholders, designed to engage community members at multiple levels and through multiple channels, and supported and sustained through local partnerships.

#### Conflicts of interest

The authors declare that there are no conflicts of interest regarding the publication of this paper.

#### Role of funding

The Shape Up Somerville intervention was funded primarily by grant R06/CCR121519-01 from the Centers for Disease Control and Prevention. Additional funding was provided by the New Balance Foundation, John Hancock Financial Services, Blue Cross Blue Shield of Massachusetts, United Way of Mass Bay, The Potato Board, Stonyfield Farm, and Dole Foods.

#### Acknowledgments

We thank Tufts University and City of Somerville collaborators for their efforts with study design, intervention implementation, and data collection, entry, and management, as well as the two control communities and the community of Somerville for their cooperation, participation, and commitment.

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