Journal of Community Health (2019) 44:1009–1018
https://doi.org/10.1007/s10900-019-00675-0

ORIGINAL PAPER

Combating Child Summer Food Insecurity: Examination of a Community-Based Mobile Meal Program

Janine S. Bruce[1,3] · Monica M. De La Cruz[1] · Katherine Lundberg[1] · Nicholas Vesom[1] · Javier Aguayo[1] · Sylvia Bereknyei Merrell[2]

Published online: 9 May 2019

Abstract
Low-income children's access to meals decreases during the summer months due to losing the benefit of the free and reduced-price lunches they normally receive during the school year. Few studies critically examine community-based approaches to providing summer meals. This mixed methods study examined a mobile meal program implemented in a community with large economic disparities. Parents and caregivers who attended the mobile meal program with a child at one of three sites completed surveys that screened for risk of food insecurity and examined access and utilization of community food resources. Interviews with a representative subsample of English- and Spanish-speaking participants elicited an in-depth understanding of food insecurity in the community and perspectives on the mobile meal program. Surveys (n = 284) were completed in English (78%) and Spanish (22%). Participants identified primarily as Asian (32%), Latino/Hispanic (29%), and White (27%), with 26% screening positive for risk of food insecurity within the past 12 months. Qualitative interviews (n = 36) revealed widespread support for meals served in public settings as they were perceived to be welcoming, fostered social interactions, and helped the community at large. Participants described the high cost of living as a key motivation for participating and cited immigration fears as a barrier to accessing public resources. Findings from this study suggest the importance of innovative community-based approaches to serving hard-to-reach children during the summer.

Keywords Food insecurity · Low-income children · Summer meals · Mobile meals · Disparities

Introduction

In 2017, 11.8 percent of households (15 million) in the U.S. were food insecure at some time during the year, meaning that individuals in the household experienced limited or uncertain access to adequate food as a result of lack of money and other resources [1]. In addition, one-third of food insecure households, or approximately 4.5% of households (5.8 million), experienced *very low food security* resulting in individuals altering or reducing normal eating patterns and facing physical symptoms of hunger [2]. Disparities in food insecurity are evident by disproportionally impacting those with incomes near or below the federal poverty level, Black and Hispanic households [3], and households headed by a single parent [4], immigrant mother [5], or individual with low educational attainment [6].

Despite considerable policy-level and community-based efforts to ameliorate food insecurity, it remains a persistent public health threat that cannot be ignored particularly among the most vulnerable in our country—children. In 2017, approximately 7.7% of households with children (2.9 million) reported food insecurity at some time during the year. The costs of food insecurity in children have both acute and long-lasting effects on a child's overall physical health, educational achievement, and ability to thrive and succeed in the future [7].

The summer months are particularly problematic for children who lose regular access to the school meals afforded to them during the school year. In 2017, the National School Lunch Program (NSLP) served about 30 million low-income

✉ Janine S. Bruce
jsbruce@stanford.edu

[1] Department of Pediatrics, Stanford School of Medicine, 1265 Welch Road, Stanford, CA 94305, USA

[2] Stanford-Surgery Policy Improvement Research and Education Center (S-SPIRE) and Goodman Surgical Education Center (GSEC) Department of Surgery, Stanford School of Medicine, Stanford, CA, USA

[3] 1265 Welch Road, Suite 240, Palo Alto, CA 94304, USA

children during the academic year, while only 2.6 million (about 1 out of 12) children received a summer meal, emphasizing the difficulty of reaching children during the summer [8–10].

The Summer Food Service Program (SFSP) was established in 1975 and provides meals to eligible low-income children during the school break. The program bridges the summer meal gap, allowing program sponsors the ability to serve children throughout the community. The flexibility afforded to program sponsors allows meals to be served in a variety of settings that not only include schools, but also recreation or community centers, churches, camps, community organizations, and more.

Mobile food trucks, vans, and buses equipped with refrigerated and portable coolers offer "hyper local" food delivery to rural or suburban communities where barriers such as distance, transportation, lack of knowledge of available programs, among others, prevent children from accessing a needed meal. While mobile meal programs are described across food bank, school, non-profit organization, and government websites, studies of the mobile meal program model do not exist [11–13].

The present study explored parents/caregivers' perspectives on a community-based mobile meal program for children; screened for food insecurity risk among meal program participants; and examined access and utilization of other community food resources. The mobile meal program was implemented in California's Silicon Valley where large economic disparities exist [14, 15] and approximately 13% of children lived in food insecure households in 2016 [16]. This study heeds the call to bring further evidence to the scope of food insecurity in communities, and assess existing community-based interventions aimed at promoting greater access to food resources for vulnerable populations [17].

Methods

Mixed methods were used to examine the impact of a community-based summer mobile meal program. The summer meal program was sponsored by a local Silicon Valley school district that regularly serves over 5100 students (pre-kindergarten through eighth grade). The diverse student population is primarily comprised of those who self-identify as Latino/Hispanic (38%), White (35%), and Asian (21%). In 2017, 32% of students across the district qualified for free and reduced-price lunches, with some schools having eligible student populations exceeding 50%.

Mobile Meal Program

In 2017, the district food service director and school administrators partnered with the local food bank to develop a lunchtime mobile meal program for children who have decreased access to free and reduced-price meals in the summer. The district identified "hot spots" throughout the area where low-income families were known to frequent during the summer months. Based on observations and word of mouth discussions with families in the community, they identified two standalone parks and one park with an adjacent library. The meal sites were classified as "open," meaning there was no onsite eligibility screening or enrollment process required, allowing all children to access and receive a free meal [18, 19].

The district utilized federal funding from the Seamless Summer Food program which allows eligible School Food Authorities to continue their existing federal meal programs during the summer months, with the same meal service rules and claiming procedures to prevent disruptions in service. Parents/caregivers were eligible to purchase a meal for themselves at cost for $2.00. The meal program ran 5 days a week from Monday to Friday at each of the three sites from June to August 2017. Formal outreach for the meal program included flyers distributed through schools and community agencies, banners in the community, newspaper announcements, and local resource hotlines.

Quantitative Methods

Between June and July adult parents/caregivers (≥ 18 years) attending the program with a child voluntarily participated in anonymous, self-administered surveys in either English or Spanish. Data were systematically collected across the three sites multiple days of the week to target all individuals who attended the program at least once with a child. Although district staff tallied the total number of meals distributed per site each day, program participants were not individually tracked throughout the duration of the lunch program to determine the number of meals each participant received overall.

The surveys collected participant demographic data, screened for risk of household food insecurity, assessed general program attendance, and examined understanding and utilization of other community-based food resources (e.g., food pantries, hot meal programs, and SNAP). Demographic questions were adapted from the 2013–2014 California Health Interview Survey and a two-item screening tool with validity evidence assessed the risk for food insecurity in the past 12 months. Participants were considered at risk for food insecurity if they answered affirmatively ("often true" or "sometimes true") to at least one of the two screening questions [20].

Survey data were analyzed using the statistical software package IBM SPSS Statistics Version 24.0. Descriptive data were stratified by ethnicity, household type, language and education. The Chi square test of independence with

significance set at $p \leq 0.05$ was used to determine possible associations between risk for food insecurity and participant characteristics.

Qualitative Methods

A subsample of parent/caregivers attending the program with a child voluntarily participated in anonymous one-on-one interviews in either English or Spanish. We purposefully sampled for maximum heterogeneity across program participants at each site and multiple days of the week to obtain a wide range of perceptions and experiences of both community food insecurity and the mobile meal program [21].

Interviews took place in discreet locations at each site, often at a picnic table or park bench, which allowed participants a moderate level of privacy. Interviews lasted approximately 20–30 min and participants were given a $25 gift card as an incentive. The interviews aimed to explore the primary domains covered in the survey to both verify survey responses and provide a more in-depth examination of the core study topics [22]. The interviews also assessed participant perceptions of the mobile meal program (motivations, barriers, and access) and community-level food insecurity. Feedback from community stakeholders was solicited and incorporated in the development of the qualitative interview guide [23–25].

All interviews were audio-recorded and transcribed verbatim by a transcription service. Spanish interviews were subsequently translated into English by a native Spanish-speaker. Qualitative analysis software (Dedoose©) was used to code and organize the data. A codebook was iteratively refined with input from all members of the research team until codes were stable, with a final codebook achieving an inter-rater reliability pooled Cohen's kappa score of 0.81 [26–28]. Major themes and representative quotes were identified from the coded transcripts through a similarly iterative process involving discussion and consensus. We further related our findings to the social ecological model to broadly explore the systems in which mobile meal programs operate [29]. All study procedures were approved by the Stanford University Institutional Review Board as an expedited protocol. Verbal consent was obtained from all survey and interview participants prior to data collection.

Results

Quantitative Findings

Survey participants (n = 284) attended meal programs across three different sites: two parks (n = 126) and one park with an adjacent library (n = 158). Surveys were completed in English (78%) and Spanish (22%) based on participant preference. Participants identified primarily as Asian (32%), Latino/Hispanic (29%), and White (27%). Most participants reported living in two-parent households (86%), with only 8% noting three or more adults living in the home. Most participants had 1–2 children (86%). Sixty-six percent reported that they had completed some college or less and 34% had a bachelor's or graduate degree (Table 1).

Most participants attended the meal program 1–2 days per week (77%), with only 5% reporting that they attended the program every day of the week. There was wide variation in terms of how participants heard about the program. The most commonly cited methods for hearing about the program were from friends (25%), at the library (23%), and seeing a banner in the community (22%). While the vast majority of participants did not report barriers to participation (83%), small numbers reported inconvenient times, difficulty getting to the meal site, or not liking the food provided as barriers (Table 2).

Twenty-six percent of participants screened positive for risk of food insecurity at some time in the past 12 months. Among those reporting risk of food insecurity, the majority identified as Latino/Hispanic (64%), lived in two-parent households (88%), and had 1–2 children (81%) (Table 1). When asked to report knowledge of other supplemental food programs (e.g., pantries, hot meals), 61% were aware of such programs, and among this group 28% reported past utilization. Similarly, 44% of participants were aware of the SNAP program, but only 13% were currently enrolled.

Qualitative Findings

A subsample of survey participants (n = 36) consented to participate in an additional qualitative interview conducted in Spanish (52%) or English (48%). Participants were primarily Latino/Hispanic (67%).

Mobile Meal Program Model

Serving Meals in Public Locations

Participants across program sites noted that they were drawn to the program given the public location of the meal sites. Some participants liked seeing the crowds of people coming together for the meal program. Others appreciated the overall diversity among program participants and believed that the public nature of the park was not only convenient, but it also provided an open and inclusive atmosphere.

> [The location] is a good one because every time we'll see crowds here, we'll see…varieties of people are coming, not only Americans…we get all types of people here. So I feel this park is a very good place to do the program. –*English interview at the park*

Table 1 Participant characteristics and food insecurity risk

	Total n (%)	Household food security status (*last 12 months*)	
		Food secure n (%)	Food insecure n (%)
Survey participants across three sites	n = 284	n = 280	
2 Park sites	126 (44)	89 (43)	37 (51)
Library	158 (56)	119 (57)	35 (49)
*Survey language preference**	n = 284	n = 280	
English	223 (78)	179 (86)	41 (57)
Spanish	61 (22)	29 (14)	31 (43)
*Race/Ethnicity**	n = 257	n = 279	
Latino/Hispanic	83 (29)	40 (19)	41 (57)
Asian	91 (32)	80 (39)	9 (13)
White	77 (27)	67 (32)	10 (14)
Black/African American	6 (2)	2 (1)	4 (5)
Native Hawaiian/Pacific Islander	2 (1)	2 (1)	–
Multiracial	24 (9)	16 (8)	8 (11)
Household Type	n = 274	n = 273	
Two-parent/adult led	244 (88)	180 (88)	60 (87)
Single-parent/adult led	23 (8)	15 (7)	8 (12)
Grandparent or other caregiver led	10 (4)	9 (5)	1 (1)
Number of children in household	n = 276	n = 276	
1–2 children	238 (86)	180 (88)	58 (81)
3–5 children	38 (14)	24 (11)	14 (19)
Number of adults in household	n = 279	n = 279	
1 adult	14 (5)	11 (5)	3 (4)
2 adults	243 (87)	183 (89)	60 (83)
3 or more adults	22 (8)	13 (6)	9 (13)
*Education**	n = 280	n = 276	
Some high school or less	18 (7)	9 (4)	9 (12)
High school diploma or GED	45 (16)	23 (11)	20 (28)
Some college	34 (12)	14 (7)	20 (28)
Bachelor's or graduate degree	183 (65)	158 (78)	23 (32)

*Statistically significant at $P \leq 0.05$

Some totals do not equal the total sample size due to differences in response rates

Several participants specifically liked the co-location of the meal program with other child- and family-centered activities. The location of the food distribution near a playground, a community center, and a music in the park event was important, as the meals and the activities were thought to complement one another nicely. One Spanish-speaking participant said, "A lot of people come from a lot of different places around here… It's a good place because it's central and because of the other activities going on here." A few participants believed the co-located activities served as a motivation for people to participate in the meal program.

Several participants specifically stated liking the social dimension to the program, given the manner in which community members were brought together in a public place. They discussed how the meal program model gives people the opportunity to interact socially. Some participants enjoyed meeting new people and families that they never talked to before. An English-speaking parent who had attended the meal program along with the music in the park noted, "we sit next to each other on picnic blankets, eating food, it's so nice. I think it's wonderful for the community." Another stated:

> We are here [at the park] coexisting, and I get to know more people. Because, for example, people can go along and pass through the park and not meet up with anybody but here [at the meal program] all are together. –*Spanish interview at the park*

Table 2 Mobile meal program participation and utilization of community programs

Program participation	n (%)
Estimated weekly attendance	n = 280
Every day (5 days/week)	15 (5)
3-4 days/week	50 (18)
1-2 days/week	215 (77)
How participants learned about program (multiple sources selected)	n = 283
Heard from friends	71 (25)
Heard from the library	65 (23)
Heard from local food bank	4 (1)
Saw banner in community	62 (22)
Saw program occurring at the park	19 (7)
Flyer from child's school	36 (13)
Flyer at community agency	20 (7)
Announcement in newspaper	5 (2)
Barriers to program participation	n = 279
No barriers	231 (83)
Lunch times were inconvenient	17 (6)
Getting to site was difficult	9 (3)
Did not like food offered	7 (3)
Other difficulties not specified	15 (5)
Knowledge and utilization of food programs	
Other food programs (e.g., pantries, hot meals etc.*)*	n = 284
Knowledge of other food programs	172 (61)
If knowledgeable, reported past utilization	49 (28)
SNAP	n = 284
Knowledge of SNAP	124 (44)
Currently enrolled in SNAP	38 (13)

Some totals do not equal the total sample size due to differences in response rates

SNAP Supplemental Nutrition Assistance Program

Appreciation for a Program That Helps the Community

Among most participants interviewed, there was a strong appreciation for the meal program overall. Whether the meal program addressed personal needs for food assistance or the needs of the community at large, the program was largely seen as a positive community benefit for families who struggled to make ends meet.

> I think it [meal program] is important and I think the program is really good, especially for the community. [The meal program] helps low-income families come out and just hang out and that's just a meal they don't have to worry about for the day…it helps out. *–English interview at the library*

A few participants said that they were grateful to know that people in the community cared about them and were providing important resources to those in need. An overall perception among participants was that every little bit of support helps to make their lives easier.

> A lot of people have a good heart and come here every lunchtime…maybe it's [the meal program] volunteers…That's why I like America, a lot of the people have really very good heart and help our people. *–English interview at the park*

Meal program staff were described as warm and kind-hearted individuals who genuinely wanted to help the community. Several participants cited that staff kindness and attention created a safe and trusting atmosphere, one that made them feel welcome and encouraged them to utilize the meal program. One Spanish-speaking participant said, "I like the treatment, the people [meal program staff] treat us well and in truth we never feel uncomfortable. They give us trust to approach them and ask for lunch."

Motivations and Barriers to Attending the Program

Community-Level Food Insecurity

Many participants indicated that household food insecurity was a strong motivation for participation. Several participants indicated that they did not have enough money each month to cover all of their expenses, including the cost of food. Low wages and unemployment were commonly cited as drivers of food insecurity.

> It [unemployment] wasn't a long period of time, but we had to get help while we were unemployed and now we are [employed] but it's still expensive. You know, food is expensive. No matter how you look at it. Even when you're trying to feed your children, good food, it's expensive. *–English interview at the park*

Even when unemployment was not a problem, the exceptionally high cost of living in Silicon Valley makes it more difficult for families to make ends meet. One participant mentioned how some families are forced to work two or more jobs just to have enough to buy food for their family. Many participants also indicated that they spend a large portion of their income on housing and rent. Participants recounted knowing multiple families who needed to live in the same house or apartment with one or more other families to be able to afford living in the area.

After deducting rent and other expenses, providing enough food posed a significant financial strain on families, leaving many families with little to no disposable income. The money saved through programs such as the mobile meal program was believed to lessen a family's overall financial strain.

> Now I have to rent out a living room, but it is really expensive, and sometimes we run out of money for food. Families are forced to look for supplemental sources of income in order to provide enough food. The mobile meal program provides them [families] with some food, which allows them to have more disposable income to cover other expenses and not have to worry about food. –*Spanish interview at the park*

The additional need for food support during the summer was pointed out by several participants. Participants with school-aged children repeated how the summer months are more difficult with added food costs while children are on break from school and not receiving free and reduced-price meals. One English-speaking participant described how difficult it is to "figure out how to feed your children when it's summertime." Another participant noted:

> When they are home for the whole summer with me it's difficult to come up with different things to cook for them at lunch. Sometimes I run out of food…I mean, not completely…[but] this [meal program] is a really, really nice option. –*English interview at the park*

While not all participants reported first-hand experience with food insecurity, nearly all recognized that food insecurity was a problem in the community. As such, there was a prevailing view that supplemental community programs were important for the community at large.

Parents' Demanding Work Schedules Prevent Participation

Some participants pointed out that many children often stay at home alone or are with neighbors or friends during the summer months. Parents' demanding work schedules and lack of access to low-cost summer enrichment programs were thought to contribute to the reasons why some children were unable to participate. A few meal program participants worked as nannies and attended the meal program with children who were not their own. These participants acknowledged that while the children in their care were not food insecure, their own children at home were food insecure. During the day, they did not have the ability to transport their own children to the meal sites, despite wishing their own children could participate. They also regretted that their children were unable to utilize the recreational activities at the park and library.

Immigration Fears

Some participants pointed out that immigration fears were keeping some families from enrolling in public programs. One participant heard through word-of-mouth that individuals could be deported if they used food stamps because the government wants to "deport people who grab money." Other participants worried that their children could be taken away, or that utilization of resources could jeopardize their child's immigration status. Another Spanish-speaking parent mentioned confusion and doubt regarding which programs would impact immigration status.

> Food stamps are very common in a variety of parts [areas], but according to a lot of people they are afraid to try this program because of all the [political environment]…If you can apply, it shouldn't be a problem, but some people are still fearful…There are some people who have lived here a very long time and understandably they are afraid. –*Spanish interview at the park*

Participants discussed worries about being enrolled in programs, as their information could be accessed by government agencies, prompting deportations. One Spanish-speaking participant said, "Now with the rumors of the President and politics, many people are opting out [of public programs]." Other participants suggested that community organizations should clarify the information that they need to collect at enrollment and how data will be shared with government agencies.

> From my point of view, they should say during the appointments [to enroll in programs] to not be scared, because everything is confidential and it is independent from all the legal stuff. And [they should] clarify that any information given is for the city and community because they need the data as proof to all the donations they receive. –*Spanish interview at the park*

Discussion

Mobile Meal Program Model

The goal of the mobile meal program presented in this study was to increase low-income children's access to free meals during the summer by situating meal sites in locations heavily utilized by children and families such as parks and outdoor spaces. Participants across program sites voiced strong support and appreciation for serving free child meals throughout the community and valued the open and welcoming nature of the program. Gratitude for a community-wide, inclusive meal program is not new. A study of a library-based meal program similarly found that participants were thankful that the meal program was open to all and cultivated an atmosphere where all were welcome to join and share a meal [30]. Other studies document the importance of community food programs (e.g.,

summer meal programs, community gardens, community kitchens) in not only addressing immediate food security needs, but also the ability of such programs to foster cross-cultural exchanges and opportunities for social networking among program participants [30–33]. These important intentional or unintentional outcomes associated with community meal programs can, in the future, be deliberate program features designed to increase access and utilization among disenfranchised populations.

Meal program participants also equated the program with a "community benefit" sponsored by leaders in their neighborhood who sought to help local children and families. They expressed appreciation for a program that was developed by the community, for the community. While multiple studies have established a link between "formal" public assistance programs (e.g., school breakfast program, NSLP, SNAP) and improved rates of food security [34–36], only a few studies demonstrate associations between "informal" support (e.g., social support, social cohesion, and social capital) and reductions in the risk of food insecurity. King (2017) found that among disadvantaged urban mothers both social support and social cohesion had three important outcomes: reduced the risk of food insecurity, reduced the risk of remaining food insecure, and reduced the risk of becoming food insecure [37].

Sharing resources, such as a meal, with one's family, friends, and neighbors creates a strong sense of social cohesion. This practice also fosters an environment where community members are willing to help one another obtain resources for ongoing mutual support. As such, food assistance programs that nurture a close-knit community atmosphere may reduce the overall risk of food insecurity through informal support mechanisms [38–40]. While our study did not quantitatively assess changes in the risk of food insecurity following participation in the program, participants' perceived sense of community benefit suggests the need to examine the associations between this community meal program model and informal support measures, and overall reductions in the risk of food insecurity.

The mobile meal program outlined in this study was designed to change the way children access free meals during the summer. Instead of solely serving meals at traditional summer meal locations, some which may require program enrollment, the mobile program brought meals to highly public locations that were thought to be accessible to low-income children. The structural difference in how this model was developed and implemented is evident. We used the Social Ecological Model described by Golden et al. (2015) to illustrate how the complex interplay between individuals and groups within a supportive community and policy environment came together to increase children's access to healthy nutrition during the summer (Fig. 1).

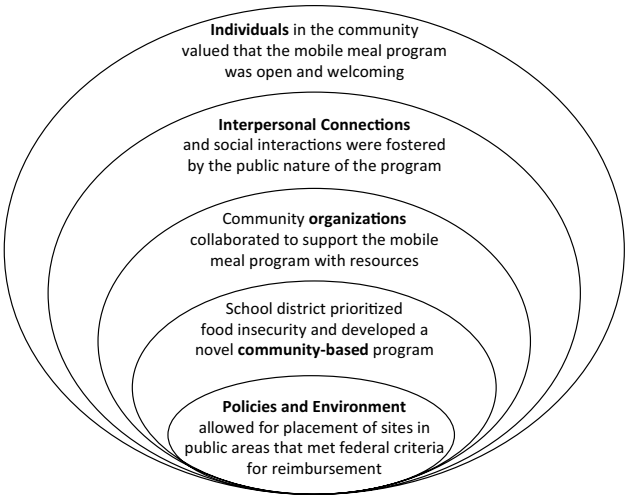

Fig. 1 Adaption of the Social Ecological Model of policy and environmental change to the mobile meal program

Economic Disparities

Twenty-six percent of survey participants screened positive for the risk of household food insecurity during the past 12 months, considerably higher than the national estimates of food insecurity among households with children (16.5% in 2016) [41]. During interviews with participants many discussed their struggles to make ends meet, primarily citing the high cost of living as the main contributor to food insecurity in the community. Despite the wealth of Silicon Valley, the cost of living in this area is among the highest in the U.S., with rising levels of income inequality highlighting the juxtaposition of extreme wealth with acute poverty that is present in this region [14]. Low- and middle-income families living in this area struggle and often pay exorbitantly high rent, experience crowded housing (> 2 families per home), or live in recreational vehicles parked along public roads and homeless shelters [42, 43]. Studies demonstrate the association between household crowding and child food insecurity, underscoring the impact on those who are both food and housing insecure [44, 45]. There is great need to identify and serve families living in crowded pockets of poverty but doing so is challenging in communities with high-income inequality due to their lack of visibility in these areas. Given these challenges, service providers and aid organizations are tasked with developing creative solutions, such as mobile meal programs, to reach the hardest-to-reach children and families.

National studies of the prevalence of food insecurity demonstrate that those living near or slightly above the poverty threshold for federal nutrition programs still report experiencing food insecurity [1]. The 2017 U.S. Department of Agriculture report on food security showed that 5.8% of

households with incomes above 185% of the federal poverty level (income limit for reduced-price school meals) were food insecure [2]. In areas such as Silicon Valley where the cost of living is extremely high, the rate of food insecurity among families with incomes too high to qualify for safety net programs may be well above this level. As income inequalities continue to grow in communities across the U.S., it will be increasingly important for policy leaders to account for geographic variations in determining poverty thresholds for vital nutrition programs. Until this occurs, there will be an increasing burden on "informal" safety net programs such as food pantries, hot meals, and other charitable food programs.

The adage that "location is everything" is fitting for our examination of the mobile meal program model. The USDA's Food and Nutrition Service provides flexibility to federal meal program sponsors to serve meals to children in non-traditional sites, as long as over 50% of the child population is eligible for free and reduced-price lunches. All meal program sites described in this study were "open" meal sites [18]. Removal of stringent eligibility criteria and arduous enrollment processes not only simplifies program participation overall, but also increases access to harder-to-reach populations who face eligibility and structural barriers to participation [46–48].

Despite the flexibility afforded to federal sponsors, implementation of meal program sites in areas with large economic disparities is challenging. Finding locations ideal for low-income children and families is difficult given that some sites are often situated in higher income areas, which are not eligible based on federal meal program guidelines. As such, program sponsors are faced with limitations to where and how they serve meals to families living in pockets of poverty. Given that meal programs such as SFSP are highly underutilized despite high levels of eligibility in states such as California [49], it is important for policy leaders to consider the constraints imposed on federal sponsors serving eligible children living in communities with high economic disparities. Providing expanded geographic eligibility for federal sponsors running mobile meal programs is a possible step toward ensuring access to the hardest-to-reach children.

Immigration Fears

Despite the public and inclusive nature of the mobile meal program, immigration fears were a perceived barrier to participation. Some participants voiced anxiety associated with congregating in public spaces. For some, the risk of a potential immigration raid or deportation was more compelling than the desire to participate in a community-based meal program—a level of trepidation that has been substantiated in the literature [50]. The level of worry and fear among this population is particularly troubling since immigrants are more likely to be food insecure compared to their non-immigrant counterparts [51]. While we could not find a definitive study documenting the reluctance to utilize community meal programs due to immigration fears, studies do show that immigration enforcement policies (including deportation) not only heighten levels of stress but also impact access and utilization of health services [52, 53], ultimately deterring immigrants from enrolling in public programs [54]. As national policies and the social climate become increasingly hostile to immigrants, it is imperative that service providers acknowledge the role immigration fears may play in hindering families' access to public nutrition and community-based food programs.

Limitations

Findings from this study are limited in that they can only be generalized to participants of the mobile meal program sites included in this study. We recognize that other mobile program sites may be situated in communities without the unique economic disparities inherent in areas such as Silicon Valley. As such, the attitudes and perceptions of participants from this mobile meal program may not be representative of individuals participating in other community-based meal programs. However, we believe that our purposeful sampling techniques allowed us to obtain perspectives from a diverse group of program participants. Additionally, we are confident in our findings due to our use of mixed methods, verifying the quantitative survey data trends with qualitative findings [22]. Our study may be biased by the fact that those participating in the mobile meal program were likely more representative of individuals experiencing fewer barriers to participation. Despite the school district's efforts to target locations where large numbers of low-income children were likely to congregate during the summer, work constraints and immigration fears were likely barriers to program participation. Future studies similarly examining community-based meal programs should ensure that extensive efforts are taken to include voices of both participants and non-participants if program barriers are to be fully understood.

Conclusion

This study provides a first examination of a community-based mobile meal program. This study emphasizes the unique benefits associated with serving meals in a welcoming and highly accessible community setting. As experts in the field continue to stress the need to increase the number of summer meal sites to decrease summer food insecurity among children [49, 55], mobile meal programs provide an innovative approach to reaching hard-to-reach children during the summer. These and other community-based meals

programs are critical to promoting child food security and ensuring that no child ever goes hungry.

Acknowledgments We would like to thank Marie Pfeiffer and Cindy McCown of Second Harvest Food Bank and Debbie Austin of the Mountain View Whisman School District for their support in the development and implementation of this study. We would also like to thank Rubi Santillanez, Maria Toulokhonova, and Yvonne Molina for their assistance in data collection and analysis.

Funding Second Harvest Food Bank of Santa Clara and San Mateo Counties provided support for this study.

Compliance with Ethical Standards

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

References

1. Cook, J. T., & Frank, D. A. (2008). Food security, poverty, and human development in the United States. *Annals of the New York Academy of Sciences, 1136*(1), 193–209.
2. Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Singh, A. (2018). Household Food Security in the United States in 2017, ERR-256, (pp. 44). USDA Economic Research Service. Retrieved March 9, 2019 from https://www.ers.usda.gov/webdocs/publications/90023/err-256.pdf.
3. Alaimo, K., Briefel, R. R., Frongillo, E. A., Jr., & Olson, C. M. (1998). Food insufficiency exists in the United States: Results from the third National Health and Nutrition Examination Survey (NHANES III). *American Journal of Public Health, 88*(3), 419–426.
4. Coleman-Jensen, A., Rabbitt, M. P., Gregory, C. A., & Sing, A. (2016). Household Food Security in the United States in 2015, ERR-215, (pp. 1–36). USDA Economic Research Service. Retrieved March 9, 2019 from https://www.ers.usda.gov/webdocs/publications/err215/err-215.pdf.
5. Chilton, M., Black, M. M., Berkowitz, C., Casey, P. H., Cook, J., Cutts, D., et al. (2009). Food insecurity and risk of poor health among US-born children of immigrants. *American Journal of Public Health, 99*(3), 556–562.
6. Coleman-Jensen, A., McFall, W., & Nord, M. (2013). Food insecurity in households with children: Prevalence, severity, and household characteristics 2010–2011, (pp. 1–52). USDA Economic Research Service. Retrieved March 9, 2019 from https://www.ers.usda.gov/publications/pub-details/?pubid=43765.
7. Stuff, J. E., Casey, P. H., Szeto, K. L., Gossett, J. M., Robbins, J. M., Simpson, P. M., et al. (2004). Household food insecurity Is associated with adult health status. *The Journal of Nutrition, 134*(9), 2330–2335.
8. USDA Food Nutrition Service. (2018). Child Nutrition Tables, National Level Annual Summary Tables: FY 1969-2017. USDA Food Nutrition Service,. Retrieved March 9, 2019 from https://www.fns.usda.gov/pd/child-nutrition-tables.
9. Nord, M., & Romig, K. (2006). Hunger in the summer: seasonal food insecurity and the National School Lunch and Summer Food Service programs. *Journal of Children & Poverty, 12*(2), 141–158.
10. Huang, J., Barnidge, E., & Kim, Y. (2015). Children receiving free or reduced-price school lunch have higher food insufficiency rates in summer. *The Journal of Nutrition, 145*(9), 2161–2168.
11. Palmer DeFrank, S. (2016). Innovative ideas to address summer hunger gap. California Association of Food Banks. Retrieved December 1, 2018 from http://www.cafoodbanks.org/blog/innovative-ideas-address-summer-hunger-gap.
12. USDA Food Nutrition Service. (2018). Summer Food Service Program (SFSP): Mobile Feeding. Retrieved March 9, 2019 from https://www.fns.usda.gov/mobile-feeding-options-summer-feeding-programs-0.
13. No Kid Hungry: Center for Best Practices. Launch a mobile meals program. Retrieved November 28, 2018 from http://bestpractices.nokidhungry.org/programs/summer-meals/launch-a-mobile-meals-programfiles/3690/launch-a-mobile-meals-program.html.
14. Massaro, R. (2015). 2015 Silicon Valley Index, (pp. 1–88). Joint Venture Silicon Valley. Retrieved March 9, 2019 from http://www.jointventure.org/images/stories/pdf/index2015.pdf.
15. Gundersen, C., Engelhard, E., & Waxman, E. (2014). Map the Meal Gap: Exploring food insecurity at the local level. *Applied Economic Perspectives and Policy, 36*(3), 373–386.
16. Gundersen, C., Dewey, A., Crumbaugh, M., Englehard, K., & Engelhard, E. (2018). Map the Meal Gap: A report on county and congressional district food insecurity and county food cost in the United States in 2016, (pp. 1–24). Feeding America. Retrieved March 9, 2019 from https://www.feedingamerica.org/sites/default/files/research/map-the-meal-gap/2016/2016-map-the-meal-gap-all-modules.pdf.
17. Tarasuk, V. (2001). A critical examination of community-based responses to household food insecurity in Canada. *Health Education & Behavior, 28*(4), 487–499.
18. USDA Food and Nutrition Service. (2016). Summer Food Service Program (SFSP). *Program Fact Sheet*. USDA Food, Nutrition, and Consumer Services. Retrieved June 14, 2016 from http://www.fns.usda.gov/sfsp/frequently-asked-questions-faqs.
19. USDA Food Nutrition Service. (2017). School Meals: An Opportunity for Schools. Retrieved December 1, 2019 from https://www.fns.usda.gov/school-meals/opportunity-schools.html.
20. Hager, E. R., Quigg, A. M., Black, M. M., Coleman, S. M., Heeren, T., Rose-Jacobs, R., et al. (2010). Development and validity of a 2-item screen to identify families at risk for food insecurity. *Pediatrics, 126*(1), e26–e32.
21. Patton, M. (1990). Purposeful sampling. *Qualitative Evaluation and Research Methods, 2,* 169–186.
22. Creswell, J. W., & Plano Clark, V. L. (2017). *Designing and conducting mixed methods research*. Thousand Oaks, CA: Sage.
23. Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating rigor using thematic analysis: A hybrid approach of inductive and deductive coding and theme development. *International Journal of Qualitative Methods, 5*(1), 80–92.
24. Ryan, G. W., & Bernard, H. R. (2003). Techniques to identify themes. *Field Methods, 15*(1), 85–109.
25. Malterud, K. (2001). Qualitative research: standards, challenges, and guidelines. *The Lancet, 358*(9280), 483–488.
26. Bertrand, J. T., Brown, J. E., & Ward, V. M. (1992). Techniques for analyzing focus group data. *Evaluation Review, 16,* 198–209.
27. Fonteyn, M. E., Vettese, M., Lancaster, D. R., & Bauer-Wu, S. (2008). Developing a codebook to guide content analysis of expressive writing transcripts. *Applied Nursing Research, 21*(3), 165–168.
28. Campbell, J. L., Quincy, C., Osserman, J., & Pedersen, O. K. (2013). Coding in-depth semistructured interviews problems of unitization and intercoder reliability and agreement. *Sociological Methods & Research, 42*(3), 294–320.
29. Golden, S. D., McLeroy, K. R., Green, L. W., Earp, J. A. L., & Lieberman, L. D. (2015). Upending the Social Ecological Model to guide health promotion efforts toward policy and environmental change. *Health Education & Behavior, 42*(1_suppl), 8S–14S.

30. Bruce, J. S., De La Cruz, M. M., Moreno, G., & Chamberlain, L. J. (2017). Lunch at the library: examination of a community-based approach to addressing summer food insecurity. *Public Health Nutrition, 20*(09), 1640–1649.
31. Dailey, A. B., Hess, A., Horton, C., Constantian, E., Monani, S., Wargo, B., et al. (2015). Healthy options: a community-based program to address food insecurity. *Journal of Prevention & Intervention in the Community, 43*(2), 83–94.
32. Roncarolo, F., Adam, C., Bisset, S., & Potvin, L. (2015). Traditional and alternative community food security interventions in Montreal, Quebec: different practices, different people. *Journal of Community Health, 40*(2), 199–207.
33. Iacovou, M., Pattieson, D. C., Truby, H., & Palermo, C. (2012). Social health and nutrition impacts of community kitchens: a systematic review. *Public Health Nutrition, 16*(3), 535–543.
34. Bartfeld, J. S., & Ahn, H.-M. (2011). The school breakfast program strengthens household food security among low-income households with elementary school children. *The Journal of Nutrition, 141*(3), 470–475.
35. Huang, J., & Barnidge, E. (2016). Low-income children's participation in the National School Lunch Program and household food insufficiency. *Social Science and Medicine, 150,* 8–14.
36. Gundersen, C., Kreider, B., & Pepper, J. (2012). The impact of the National School Lunch Program on child health: A nonparametric bounds analysis. *Journal of Econometrics, 166*(1), 79–91.
37. King, C. (2017). Informal assistance to urban families and the risk of household food insecurity. *Social Science and Medicine, 189,* 105–113.
38. Denney, J. T., Kimbro, R. T., Heck, K., & Cubbin, C. (2017). Social cohesion and food insecurity: Insights from the Geographic Research on Wellbeing (GROW) Study. *Maternal and Child Health Journal, 21*(2), 343–350.
39. Carter, M. A., Dubois, L., Tremblay, M. S., & Taljaard, M. (2012). Local social environmental factors are associated with household food insecurity in a longitudinal study of children. *BMC Public Health, 12*(1), 1038.
40. Martin, K. S., Rogers, B. L., Cook, J. T., & Joseph, H. M. (2004). Social capital is associated with decreased risk of hunger. *Social Science and Medicine, 58*(12), 2645–2654.
41. USDA Food and Nutrition Service. (2016). National School Lunch Program (NSLP). *Program Fact Sheet*. USDA Food, Nutrition, and Consumer Services. Retrieved June 14, 2016 from http://www.fns.usda.gov/nslp/national-school-lunch-program-nslp.
42. Associated Press. (2017). Silicon Valley's 'car people' push homeless crisis to the brink (November 17, 2017), *New York Post*. Retrieved March 9, 2019 from https://nypost.com/2017/11/07/silicon-valleys-car-people-push-homeless-crisis-to-the-brink/.
43. Gee, A. (2017). Low-income workers who live in RVs are being 'chased out' of Silicon Valley streets (June 29, 2017), *The Guardian*. Retrieved September 28, 2018 from https://www.theguardian.com/us-news/2017/jun/29/low-income-workers-rvs-palo-alto-california-homeless.
44. Cutts, D. B., Meyers, A. F., Black, M. M., Casey, P. H., Chilton, M., Cook, J. T., et al. (2011). US housing insecurity and the health of very young children. *American Journal of Public Health, 101*(8), 1508–1514.
45. Ruiz-Castell, M., Muckle, G., Dewailly, É., Jacobson, J. L., Jacobson, S. W., Ayotte, P., et al. (2015). Household crowding and food insecurity among inuit families with school-aged children in the Canadian Arctic. *American Journal of Public Health, 105*(3), e122–e132.
46. Hanratty, M. J. (2006). Has the Food Stamp program become more accessible? Impacts of recent changes in reporting requirements and asset eligibility limits. *Journal of Policy Analysis and Management, 25*(3), 603–621.
47. Schanzenbach, D. W. (2009). Experimental estimates of the barriers to Food Stamp enrollment, Discussion Paper no. 1367-09, (pp. 1–27). University of Chicago. Retrieved March 9, 2019 from https://www.ssc.wisc.edu/irpweb/publications/dps/pdfs/dp136709.pdf.
48. Ratcliffe, C., McKernan, S. M., & Finegold, K. (2007). The effect of state Food Stamp and TANF policies on Food Stamp program participation, (pp. 1–52). The Urban Institute. Retrieved March 9, 2019 from https://www.urban.org/sites/default/files/publication/46406/411438-The-Effect-of-State-Food-Stamp-and-TANF-Policies-on-Food-Stamp-Program-Participation.PDF.
49. Sharp, M. (2005). School's out…who ate?: A report on summer nutrition in California, (pp. 1–25). California Food Policy Advocates. Retrieved November 11, 2018 from https://cfpa.net/ChildNutrition/Summer/CFPAPublications/SOWA-FullReport-2017.pdf.
50. Chaudry, A. (2011). Children in the aftermath of immigration enforcement. *The Journal of the History of Childhood and Youth, 4*(1), 137–154.
51. Hofferth, S. L. (2014). Persistence and change in the food security of families with children, 1997–99). University of Maryland and USDA Economic Research Service. Retrieved March 3, 2018 from https://www.ers.usda.gov/publications/pub-details/?pubid=43415.
52. Hacker, K., Chu, J., Leung, C., Marra, R., Pirie, A., Brahimi, M., et al. (2011). The impact of immigration and customs enforcement on immigrant health: Perceptions of immigrants in Everett, Massachusetts. *USA. Social Science & Medicine, 73*(4), 586–594.
53. Rhodes, S. D., Mann, L., Simán, F. M., Song, E., Alonzo, J., Downs, M., et al. (2015). The impact of local immigration enforcement policies on the health of immigrant Hispanics/Latinos in the United States. *American Journal of Public Health, 105*(2), 329–337.
54. Perreira, K. M., Crosnoe, R., Fortuny, K., Pedroza, J., Ulvestad, K., Weiland, C., et al. (2012). Barriers to immigrants' access to health and human services programs, (pp. 1–19). Office of the Assistant Secretary for Planning and Evaluation. Retrieved March 9, 2019 from https://aspe.hhs.gov/basic-report/barriers-immigrants-access-health-and-human-services-programs.
55. Gundersen, C., & Ver Ploeg, M. (2015). Food assistance programs and child health. *The Future of Children, 25*(1), 91.