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Evaluation of a Social Marketing Campaign to Increase Awareness of Immunizations for Urban Low-Income Children

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Abstract

Objective—To assess community awareness of childhood immunizations and intent to immunize children after a social marketing immunization campaign.

Methods—We used 2 interviewer-assisted street-intercept surveys to evaluate awareness of childhood immunizations and intent to immunize low-income children. The “Take Control! Immunize” social marketing campaign was developed using a community-based participatory research approach and used billboards, flyers, and various “walking billboard” (eg, backpacks, pens) to deliver immunization messages in the community settings.

Results—Over 85% of community members recalled the “Take Control! Immunize” message. Almost half of those who saw the immunization message indicated that the message motivated them to act, including getting their children immunized or calling their physician to inquire about their children's immunizations status. All respondents indicated that immunizations were important for children and that they were likely or very likely to immunize their children. Respondents who reported that “Take Control!” messages motivated them to act in the first intercept survey were significantly more likely than those in the second intercept to report being likely or very likely to immunize their children.

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Conclusion—Culturally appropriate social marketing immunization messages in targeted urban settings can increase parental awareness and behavioral intention to immunize children.

Introduction

Racial and ethnic disparities in immunization coverage exist in the United States,[1-3] with racial/ethnic children of color less likely than white children to be up-to-date on their immunizations.[3,4] Under-vaccinated children are more likely to be black, have a young mother, reside in urban, central city settings, and live in poverty.[5] The burden of under vaccination is evident in inner city Milwaukee, Wisconsin neighborhoods, where immunization coverage for low-income children 19-35 months is estimated at 35% to 40% compared to over 75% in the state. According to the United States Census Bureau, Milwaukee is the second most segregated and the fourth most impoverished city in the nation, with almost half of the children and 20.9% of residents (compared to 12.5% in the state) living in poverty. These demographic characteristics further complicate efforts to increase childhood immunization in the city. Research shows that poverty accounts for almost all the racial/ethnic disparities for childhood immunization rates[6] and contributes significantly to other immunization barriers including limited access to transportation, lack of insurance coverage, and inadequate availability of health care providers and vaccines.[7] Traditional approaches to increase immunization coverage, however, have had limited effectiveness in reaching the most marginalized and vulnerable populations, especially low-income, inner city and rural populations of children. Reducing racial/ethnic disparities in childhood immunizations coverage is, therefore, an important social and public health goal.

Almost one-third (28%) of parents report they are unsure, delayed, or refused vaccines.[8] Although the underlying reasons for parental hesitancy to immunize children[9,10] are not clear, a number of factors, including poverty; cultural or religious objections; media misinformation of risk, benefits, and effectiveness of vaccines; and historical racism and mistrust of state and national agencies that formulate immunization guidelines and regulations play a role.[11-15]

The American Academy of Pediatrics (AAP) policy statement on increasing immunization coverage advocates for mounting a vigorous "…public relations campaign to inform the public and counter the influence of misinformation spread by celebrities and others who participate in the antivaccination movement to minimize the negative impact of this false information on the health of children. The public must be educated with regard to the risks associated with vaccine-preventable diseases and the impact of immunizations on their prevalence by using culturally tailored materials in English and other languages."[16] The use of social marketing approaches is an effective strategy to accomplish this AAP social and public health education immunization goal. As a behavioral change model, social marketing "applies traditional marketing principles and techniques to influence targeted audience behaviors to benefit the individual and society, such an example would be tobacco control and prevention programs."[17] As a behavior change strategy, social marketing uses a "marketing mix" consisting of 4 Ps of marketing (place, price, product, and promotion) to develop effective strategies to achieve a desired behavior change.[17] The application of social marketing in a community-based participatory research (CBPR) context is an innovative

approach of increasing community input and participation in the design, content, and application of immunization messages in under-resourced communities.

The main objective of this study was to examine the efficacy of a social marketing campaign aimed at increasing awareness and behavioral intent to immunize children in low-income urban setting. We examined whether: (1) there were significant differences between “billboard” and “billboard-enhanced” social marketing approaches in increasing awareness and intent to immunize African-American children in urban, low-income communities; and (2) the overall social marketing campaign was associated with increased awareness and intent to immunize children.

Methods

The social marketing campaign was implemented in 2 phases as part of the Community Health Improvement for Milwaukee's Children (CHIMC) Save Lives-Immunize project, Since 2005, this CBPR project was funded by the National Center for Minority Health and Health Disparities (NCMHD) to improve immunization coverage in select predominantly African American low-income urban neighborhoods in Milwaukee. The Milwaukee neighborhoods targeted by the program had low immunization coverage of about 35% at baseline for children 19-35 months compared to 73.6% in Milwaukee County, 77.7% in Wisconsin, and 76.1% in the United States.

The first phase (billboards only) included the use of project and community health plan cobranded billboards located in a minimum of 3 locations within targeted Milwaukee ZIP codes and immediate adjacent areas. The project staff distributed fliers at community events during the social marketing implementation phase. The second phase (billboard enhanced) was more comprehensive and included Phase 1 activities along with a variety of “walking billboard” marketing materials including backpacks, pens, pencils, magnets, hand sanitizers, band-aid holders, door hangers, t-shirts, stickers, and fliers that contained the social marketing message to children and families throughout the targeted areas. The staff handed out these items at community events, posted fliers at community locations (eg, community agencies, grocery stores, retail sites), and dropped off backpacks (for back-to-school events) filled with the project's products at community sites to be distributed to residents. This study compared a “billboard” (Phase 1) and “billboard-enhanced” (Phase 2) campaign using 2 intercept surveys corresponding to each phase.

Messages

The development of the social marketing campaign messages began in January 2010. Cluster analysis was used to identify and place respondents into categories based on their attitudes toward immunizations: health advocate, immunization advocate, fence-sitter, go along to get along, and skeptic, as described by Gust and colleagues.[18] To develop the social marketing messages, the project team conducted 2 focus groups in March and April of 2010 among respondents categorized as advocates (health advocates and immunization advocates) and fence-sitters (undecided). In these sessions, respondents engaged in brainstorm activities to identify culturally appropriate marketing messages for the campaign that were utilized to inform and guide the development of the social marketing intervention messages. Options

for the final messages were presented to the project's steering committee for deliberation and a vote to identify the final message for use in the social marketing campaign. The steering committee chose the message “Take control! Protect your child with immunizations” along with 3 additional mock messages (Figure). The social marketing campaign intervention began in May 2010 and consisted of posting positive messages about keeping children up-to-date with their immunizations. Marketing of the campaign message “Take control! Protect your child with immunizations” was conducted in collaboration with a community health plan using billboards, fliers, and posters placed in strategic community locations.

Intercept Surveys

The project team evaluated the social marketing campaign using 2 interviewer-assisted street-intercept surveys applying a stratified convenience sampling technique of community members in Milwaukee aged 18 and over. The first intercept was planned to occur 2 months after the billboards were posted in communities. The intercept survey consisted of 6 questions administered by trained community outreach workers and community members who were part of the project and were trained as part of the CBPR colearning process. The survey assessed awareness of the immunization message and its influence on motivating them to take any subsequent actions to address their children's immunizations.

Phase 1 intercept surveys were conducted between August and September, 2010 and Phase 2 between February and April 2011 in targeted ZIP codes in Milwaukee. Respondents were asked to recall any health messages about children that they had read, heard, or seen within the last 3 months, first without prompts and second with visual prompts (Figure). The intercept surveys were conducted in various community settings including outside community grocery stores, neighborhood streets and bus stops, community health centers and other community sites (eg, area malls). The Children's Hospital of Wisconsin Institutional Review Board approved this study.

Data Analysis

We assessed the efficacy of the social marketing campaign by conducting an impact evaluation to directly measure the short-term effects of the campaign. To address our first objective, we compared Phase 1 and Phase 2 intercept categorical responses using chi-square or Fisher exact tests, with $P < 0.05$ considered statistically significant. Overall awareness of immunization and behavioral intent to immunize was assessed using the combined data from intercept 1 and 2. Data analysis was conducted using SPSS 20 (IBM, Armonk, New York).

Results

Respondents

As shown in Table 1, intercept 1 and 2 surveys consisted of 202 and 206 respondents, respectively. All of the respondents resided in the targeted city neighborhood, with the majority living in ZIP codes 53206, 53208, 53209, 53210, 53212, and 53216. About half of the respondents had at least 1 child (range: 0 to 8 children). Consistent with the project's target population, almost all of the intercept respondents (> 97%) self-reported their race as

African American. All the respondents were not associated with the CHIMC project. No significant differences were found between the use of billboards only and billboard-enhanced social marketing approaches.

Message Recall

As shown in Table 2, about half of respondents in intercept 1 and 2 recalled reading, hearing, or seeing any health messages in the past 3 months without prompting. When respondents were shown visual prompts (Figure) that included the project's social marketing campaign message with 3 additional mock messages, over two-thirds of respondents in both intercepts reported that they recalled seeing any health messages.

Among respondents who recalled any health messages, many indicated that they recalled the “Take control! Protect your child with immunizations” messages when given a visual prompt that included mock messages. Significant differences were identified in the proportion of respondents who recalled the mock nutrition message “Good Nutrition Saves Lives,” with 25% in intercept 1 and 14% in intercept 2 reporting that they recalled the message ($P = 0.015$). No significant differences were found between the 2-intercept surveys with regard to the other messages including the social marketing campaign message. We note, however, that the recall for the mock “Good nutrition saves lives” and “Choose water not soda,” messages decreased between the 2 intercept periods, whereas the recall for the mock “Pick on fruit, not on children! Stop bullying” and the project's “Take control! Protect your child with immunizations” message increased.

Motivation to Act on Messages

The survey also measured whether respondents who recalled the immunization message reported that the message motivated them to do anything. Almost twice as many respondents in intercept 1 reported that they got their child immunized compared to those in intercept 2 (17%). The proportion of respondents who reported that they called their doctor because of the social marketing message doubled, from about 6% in intercept 1 to 13% in intercept 2. A statistically significant difference—an 8-fold increase—between the 2 intercepts in the proportion of respondents who reported that they asked their doctor about immunizations in intercept 1 (2%) and intercept 2 (16%, $P = 0.010$) was identified.

The proportion of respondents who reported that they had reviewed their children's immunization records or told someone decreased slightly between the 2 intercept surveys. Comparing both intercepts, the proportion of respondents who reported that they checked the state's immunization registry increased slightly, while those who reported telling someone about immunizations decreased. Among those who selected “other” actions, those mentioned most frequently actions included checking with their clinic or health care provider, scheduling appointments, making sure a child was up-to-date, and trying to get their children enrolled into health plans.

Location of Messages

The most frequently mentioned locations of the project's messages included buses (35%), billboards (15%), TV/newspapers (15%), children's hospital sites (10%), and doctors' offices (10%), among other locations.

Immunization Importance and Behavioral Intentions

Almost all (96%) of the respondents reported that they believed immunizations are important for children and that they are “very likely” to immunize their children. Overall, respondents who reported that “Take Control!” messages motivated them to act were significantly more likely to report that they were likely or very likely to immunize their children ($x^2 = 6.19$, $P = 0.028$) in intercept 1 but not intercept 2 ($x^2 = 1.60$, $P = 0.281$). Moreover, significant association was found between the perceived likelihood of immunizing children and respondents' belief that immunizations were important for children. Among respondents who reported that immunizations were important for children (about 97% in both intercepts) indicated that they were likely or very likely to immunize their children in intercept 1 ($x^2 = 23.37$, $P = 0.001$) and intercept 2 ($x^2 = 72.1$, $P < 0.0001$).

Discussion

Except for 2 measures, this study found no significant differences between the “billboard” and “billboard-enhanced” social marketing approaches used. The finding suggests that the use of strategically located billboards with culturally appropriate immunization messages in targeted low-income African American urban communities can be an effective way of increasing community awareness of childhood immunizations in those neighborhoods.

Our findings also indicate that the social marketing campaign message penetrated the targeted community as indicated by the high percentage of people who heard the message, almost all of whom were not affiliated with the project. A large proportion of respondents recalled the social marketing campaign “Take Control!” message, with almost half (46%) of those who recalled the message indicating that they were motivated to act, including almost one-third who mentioned getting their children immunized. We note that many of the people who selected “other” actions did mention things related to immunization services such as making sure their child's immunizations were up-to-date. The proportion reporting that they called a doctor doubled between the 2 periods. Similarly, we found an 8-fold increase between the 2 intercepts in the number of respondents who reported that they asked their doctor about immunizations because of the project message, suggesting that the immunization message was motivating some behavioral changes and intentions to immunize children among the respondents.

The finding that almost all the respondents perceived immunizations as important for children suggests the need for more community immunization outreach similar to those of the project. The findings suggest that the social marketing message penetrated the targeted community as indicated by the high percentage of people not affiliated with the project who identified the “Take control. Immunize!” message.

Social media campaigns such as the “ask 5” model build on this type of deliberate effort to prime patients to come prepared to ask questions about their health.[19] Many patients, even those with higher education levels, often are less likely to ask their provider questions and are more likely to go home with unanswered questions. It is possible that the importance and urgency of the flu outbreak provided a natural way of discussing flu immunizations and logically a discussion of children's immunization status for other immunizations. Prompting about immunizations could therefore have originated from either the provider or the parents.

This study has several limitations. First, although we tried to reduce recall bias by using a short (2 months) recall period in the questions, differences in recall of the messages may still exist. Second, findings of this study may be generalizable to similar African American communities but not to other racial/ethnic communities. Additional research with a more generalizable sample is needed. Third, the drop in the number of parents reporting that they had their child(ren) immunized may depend on the timing of the interviews. Intercept 1 occurred at a time when many other immunization messages from various health agencies were encouraging people to get flu shots. The public health urgency of the flu may have increased awareness of the value of immunizations throughout the community and prompted parents to get their children immunized during the first intercept survey. As such, it is possible that the same urgency may not have been present during the second intercept surveys. Indeed, more respondents in the second intercept reported that they asked their doctor about immunizations than during intercept 1. Prior research shows that when prompted to ask about immunizations or other health concerns for their child(ren), parents are more likely to ask than when they are not prompted.[20]

Although mock messages were used in the study, they were designed to contain positive messages—on healthy nutrition, choosing water over soda, and stopping bullying—that were consistent with other public health priorities for children. Many of the respondents reported seeing these messages. Parents may have been more inclined to agree with the messages regardless of whether or not they had seen or heard them because these messages were positive and consistent with other public health messages to which the community had been exposed during the same period. The significant drop in the proportion of those reporting seeing the nutrition message is interesting. A drop in the other mock messages also exists—except for bullying—which suggests a differentiation of the immunization message from other types of messages in the community.

The increase in the proportion of respondents reporting seeing the “Stop Bullying” message is perhaps a reflection of antibullying messages in the local media[21,22] during the second intercept after a couple of serious bullying incidents received widespread coverage and responses from public health and policy makers. These incidents may have heightened awareness of bullying as a community problem, thereby making more respondents likely to identify this mock message as one they had heard or seen.

Conclusion

Although immunizations have been a public health success, vaccine-preventable diseases continue to occur disproportionately within low-income, racial/ethnic populations. These

conditions and their associated health consequences are preventable given that community awareness is elevated and the vaccines are made available through the health care delivery system. This study finding suggest that the use of a CBPR approach in designing the messages and identifying community placement for the billboards may have been effective in reaching the targeted communities. Culturally appropriate immunization billboards that are strategically located in targeted community sites can be an effective approach to increasing awareness and intent to immunize children in low-income urban minority neighborhoods. The social marketing campaign "Take Control!" messages initiated by the project continued in Milwaukee after the study ended, allowing for a continual influence. In addition, many of the health care delivery systems in the city have adopted immunizations as one of their health priority areas, which will allow synergy among partners to increase immunization coverage rates. The long-term sustainability and effectiveness of a social marketing campaign in increasing immunization coverage for children will depend on continuing community-academic collaboration and engagement of the larger health care systems.

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Figure. Community Health Improvement for Milwaukee's Children Social Marketing Campaign Evaluation Poster with Mock Messages

Table 1
Social Marketing Campaign Intercept Participant Demographic

Characteristics	Intercept 1 (n=202)	Intercept 2 (n=206)	All (n=408)
Not a participant of the CHIMC project (%)	99.5	97.6	98.5
Willing to participate in the intercept survey (%)	100	100	100
Residence ZIP codes (%)			
53206	18.5	15.2	16.4
53208	11.8	14.7	13.0
53209	6.7	12.3	9.3
53210	13.8	6.4	9.8
53212	4.1	10.3	7.1
53216	12.0	7.4	9.3
53218	6.2	7.8	6.9
All other ZIP codes combined (%)	26.9	25.9	28.2

Abbreviation = CHIMC, Community Health Improvement for Milwaukee's Children.

Table 2

Social Marketing Intercept Results: Childhood Immunization Awareness and Intent to Immunize

Characteristics	Billboard Intercept 1 % Yes (n)	Billboard-enhanced Intercept 2 % Yes (n)	Combined Intercepts[a] % Yes (n)	Change[b]	*P* value[c]
Recalled any public health messages (without prompting)	48 (202)	54 (206)	51 (408)	+	0.278
Saw any public health messages (with visual prompt)	69 (202)	73 (206)	71 (408)	+	0.317
If Yes, Which Messages Have You Seen:					
CHIMC take control message	84 (139)	85 (151)	84.5 (290)	+	0.765
Mock nutrition message	25 (139)	14 (151)	19.5 (290)	-	0.015
Mock water soda message	16 (139)	13 (151)	14.5 (290)	-	0.428
Mock stop bullying message	17 (139)	24 (151)	20.5 (290)	+	0.131
If Yes to CHIMC "Take Control" Message, Did it Motivate You to Do Anything	47 (116)	49 (129)	48 (245)	+	0.721
If Yes, What Did it Motivate Yo u to Do:					
Get child immunized	30 (54)	17 (64)	23.5 (118)	-	0.109
Call doctor	6 (54)	13 (64)	9.5 (70)	+	0.196
Ask doctor about immunization	2 (54)	16 (64)	9 (118)	+	0.010
Review immunization records	15 (54)	13 (61)	14 (115)	-	0.793
Tell someone	9 (54)	6 (64)	12 (118)	-	0.540
Believe immunizations are important for children	96 (198)	97 (203)	96.5 (401)	+	0.755

[a] Combined intercept shows the total combined sample (n) with the average percentage of the 2 intercepts.

[b] + and − indicates either a positive (increase) or negative (decrease) change between intercept 1 and 2

[c] *P* values based on Pearson chi-square or Fisher exact test comparisons between intercept 1 and intercept 2.