Brief Report of a Low-Cost Street-Corner Methodology Used to Assess Inner-City Residents' Awareness and Knowledge about Asthma

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INTRODUCTION

The goal of the Philadelphia Community Asthma Prevention Program (CAPP) Collaborative was to reduce the burden of asthma among children (0–18 years) living in underserved neighborhoods with high asthma prevalence by implementing a comprehensive set of community-based asthma interventions. An equally important objective of the collaborative, which included community agencies, the school district, the health department, faith-based organizations, and hospitals, was to increase the community's awareness of asthma and its capacity to address the problem. CAPP's components included home environmental remediation and educational visits (784 participants), a series of classes at community sites for children with asthma (303 participants) and caregivers (644 participants), on-site office training for primary care providers and nursing staff (196 individuals), professional asthma education for school nurses and teachers (752 participants), and asthma classes for public school students (901 participants). The collaborative also conducted a communication campaign throughout the life of the project, including notices in neighborhood newspapers, public service announcements on radio stations, postings on community agency list serves, and distribution of flyers to churches, libraries, schools, local clinics, community agencies, beauty salons, and Laundromats.

The project focused on a population of approximately 330,000 located in parts of Upper and Lower North Philadelphia, and Germantown. These areas are characterized by blighted housing, overcrowding, drug trafficking, violence, and poverty.¹ Initiation of interventions was staggered over a 5-year period (June 2003–June 2008) in 4 area quadrants identified by zip code. After its initiation, each intervention continued throughout the remainder of the project.

The CAPP team sought to obtain information related to its focus on community empowerment and broad dissemination of asthma messages. Traditional survey methods may not yield a representative sample in urban, low-income populations. Formal phone or in-person surveys to gather community data at regular intervals are costly and burdensome. Moreover these methods, as well as internet and mailed surveys, do not reach people who are illiterate, move frequently, or lack land-line phone service.^{2–5} Therefore CAPP adapted a street-intercept methodology reported by Miller and colleagues⁶ by using students to administer surveys on street corners in Philadelphia. This paper describes this approach and its results.

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METHODS

Survey Design. The survey consisted of 28 dichotomous (true/false or yes/no) questions that addressed the following 4 asthma domains: general knowledge, allergens, signs and symptoms, and awareness. Questions for the first 3 sections (general knowledge, allergens, signs and symptoms) were adapted from the validated Chicago Community Asthma Survey-32 (CCAS-32).⁷ The CAPP team formulated the following awareness questions:

- Have you received handouts, fliers, or manuals about asthma?
- Have you noticed billboards, posters, or other announcements about asthma?
- Have you heard anything on the radio or TV about asthma?
- Do you think that asthma is a problem in your neighborhood?
- Have you ever heard of CAPP?
- Have you ever attended CAPP classes?

These questions sought to measure the effectiveness of community media venues at spreading messages about asthma and word-of-mouth recognition of CAPP. The protocol also included demographic questions about the respondent's race, ethnicity, gender, and whether the respondent or a family member had asthma. The survey is online at <http://www.chop.edu/capp> and available to readers by request. The survey protocol was reviewed and approved by the institutional review board of the Joseph Stokes Research Institute at The Children's Hospital of Philadelphia, Philadelphia, PA.

Surveyor Recruitment and Training. Taking advantage of the large number of colleges and universities in the Philadelphia area, the CAPP Collaborative recruited graduate and undergraduate student volunteers to administer the survey. A different cohort of students was recruited each year. As summarized in Figure 1, all survey administrators received a basic orientation to asthma and the CAPP program and training on interview techniques. Surveyors received a script that began with an introduction of themselves as CAPP volunteers, an explanation of the survey's intent, verification that respondents were 18 years or older and had not been surveyed before, an estimate of how much time the survey would take, and a description of the small gift respondents would receive for their participation. Gifts included CAPP notebooks, highlighters, pedometers, stress balls, and other items costing less than \$3. Surveyors were instructed to read the survey questions and answer choices to respondents as written and to record responses on the survey form immediately. Trainers stressed the importance of interviewer consistency and reviewed appropriate responses to questions that respondents might ask. Training consisted of interview rehearsal, feedback from trainers, and opportunities for volunteers to ask questions.

Survey Administration. Although students administered most of the surveys, CAPP staff filled in when there were not enough student volunteers. Whereas the use of staff increased flexibility and required less training, its additional cost limited staff participation. Student involvement provided a larger pool of workers, who were less likely to anticipate responses. Moreover, participation gave students an opportunity to acquire "real world" surveying skills and learn about asthma and the community.

From spring 2004 through spring 2008, trained student volunteers and CAPP Collaborative staff administered surveys twice a year (fall and spring) at various

Summary of Student Volunteer Training			
Survey Preparation	Asking Survey Questions	Survey or Behavior	Survey or Safety
<p>Find an area with heavy pedestrian traffic.</p> <p>Obtain manager's permission in stores, community centers, or similar locations:</p> <ul style="list-style-type: none"> • Explain survey topic and importance. • Ask where to conduct surveys. 	<p>Become familiar with the questions.</p> <p>When reading the questions:</p> <ul style="list-style-type: none"> • Maintain eye contact and an even tone. • Give respondent time to think about the answer. • Don't explain questions. Read word for word and repeat as necessary. • Don't skip questions. • Probe all "don't know" answers at least once. 	<p>Be business-like, yet friendly.</p> <p>Obtain clear answers but never suggest responses:</p> <ul style="list-style-type: none"> • Remind respondent you are interested in an honest opinion and there is no correct answer. <p>Help respondent feel comfortable and relaxed.</p> <p>Record respondent's responses immediately.</p>	<p>Always use your best judgment:</p> <ul style="list-style-type: none"> • Avoid anyone who looks intoxicated, dangerous, or incapable of helping with the survey. • Travel in pairs and do not wear or carry expensive items. • Travel during daylight hours and stay in well-lit areas. • Leave a setting where you feel uncomfortable immediately and inform your supervisor.

FIGURE 1. Summary of student volunteer training.

street-corner locations, such as bus stops, subway stations, Laundromats, shopping centers, community centers, and community events. These sites were chosen because they were high-traffic and most likely to yield residents of targeted zip code areas. Surveyors had the option of being assigned to a location or choosing from a list of high-traffic locations within the CAPP project area. Scheduling was flexible to accommodate students' academic requirements with instructions to choose busy times of the day. Depending on the number of students available, surveyors were asked to complete 10 to 20 surveys within a 2-week period. To ensure safety, student surveyors worked in teams during daylight hours. Surveyors were required to wear a CAPP shirt or hat and use a project-provided pen and clipboard as identification. Over the 5-year period, increased community familiarity with this uniform appeared to facilitate survey participation.

In order to facilitate respondent recruitment, there were few restrictions on respondent eligibility. Initially, to increase consistency and to reduce bias, surveyors' were instructed to approach every third person. However, surveyors did not use this method consistently because foot traffic was erratic with crowds of people appearing at the same time, limiting surveyors' ability to identify every third person. Surveyors administered the survey to one person at a time and read the questions exactly as written without expanding on the content. After completing the survey, surveyors offered to answer questions, gave respondents a contact number for CAPP, and presented a small gift.

Survey Challenges. Survey locations presented varying degrees of challenge. Sites such as bus stops, train stations, health centers, or commercial establishments were likely to be well-populated and relatively safe. Although people waiting for transportation or services were often more receptive, they sometimes failed to complete the survey because they needed to leave suddenly. Commuter sites, such as

train stations, tended to have more residents from outside the target area. Businesses, such as shopping centers, and service providers, such as healthcare or community centers, required staff to obtain permission from managers. Although some sites tended to attract populations that lacked diversity, using a variety of locations helped to compensate for this challenge. Community locations and procedures were adapted each year based on the previous year’s experiences.

Surveys conducted outside the project area because students strayed from their assigned locations, surveys conducted in unidentified locations ($n=157$), and incomplete surveys ($n=36$) were excluded from the analysis. Respondents who did not live within the project zip codes ($n=564$) were also excluded from the analysis (see Figure 2).

Surveyors’ Evaluation. Surveyors completed a brief written questionnaire about their experiences at different survey sites, estimates of the proportion of people refusing to participate, problems encountered, and other issues of interest. Surveyors’ estimates of refusal rates decreased over time from about 60% in year 1 to about 20% in year 5. This decrease might be attributed to increased familiarity with CAPP over the years or adjustments made to the survey based on surveyor feedback. Barriers identified included survey length, potential respondents’ lack of interest in the survey topic or the incentive, weather conditions, environmental safety, competing activities, language, and distrust. Although survey length could not be changed, reformatting reduced the survey from 2 pages to 1 and enabled the surveyor to circle rather than write out responses. Moving surveys to include indoor as well as outdoor sites and to well-lit and well-populated areas addressed environmental barriers. Language barriers were addressed by the assignment of Spanish-speaking volunteers and staff using Spanish translations in areas with higher Hispanic populations. Asking respondents whether they or anyone in their family had asthma as an introductory technique helped to engage people when first approached. Also children’s interest in the incentive gift induced parents’ participation. The CAPP shirts, standard explanations of the survey’s purpose, and assignments to locations where people felt safe helped to dispel distrust.

FIGURE 2. Flow chart of included surveys.

STATISTICAL ANALYSIS

Continuous variables were summarized using means and standard deviations. Percentages were used to summarize categorical variables. The data were analyzed using *t* test (for differences between means), chi-square test (for difference between proportions), Cochran-Armitage trend test (for trends among proportions), and linear regression (for associations between a dependent variable and one or more independent variables) as appropriate. All the analyses were conducted with SAS statistical software 9.1 (SAS Institute, Cary, NC).

RESULTS

Respondent Characteristics. Characteristics of the 1,124 respondents included in the analysis appear in Table 1. Although the survey used a convenience sample rather than random selection, the survey population closely approximated the targeted area’s census data with respect to race, ethnicity, and gender. Since large portions of values are missing (Did Not Collect, DNC) for each category and the missing pattern is unknown, a formal statistical test could not be performed to determine whether the sample has the same distribution as the population (census from 2006).

Fewer people were surveyed during year 1 because initial training and the development of institutional review board protocols delayed startup. The majority of respondents were Black, non-Hispanic, and female. About one fourth of the population surveyed was Hispanic. Other characteristics of respondents, such as

TABLE 1 Characteristics of survey respondents by year (*n* = 1124) and comparison of demographic information with census tract data

	Year 1 <i>N</i> = 85	Year 2 <i>N</i> = 186	Year 3 <i>N</i> = 388	Year 4 <i>N</i> = 189	Year 5 <i>N</i> = 276	Total years	Census tract 2006 ^a
Participant residence							
Quad 1	74%	49%	34%	53%	29%	42%	40.5%
Quad 2	12%	8%	8%	6%	26%	12%	9%
Quad 3	10.5%	36%	47%	21%	17%	31%	27.5%
Quad 4	3.5%	7%	11%	20%	28%	15%	23%
Race							
White	28%	16%	9%	9%	7%	11%	21%
Black	45%	61%	69%	54%	73%	65%	62%
Asian	1%	3%	3%	1%	1%	2%	2%
Other	7%	14%	18%	2%	3%	9%	15%
DNC ^b	19%	5%	1%	34%	17%	13%	—
Ethnicity							
Hispanic	45%	31%	19%	33%	13%	24%	21%
Non-Hispanic	20%	48%	65%	44%	46%	51%	—
DNC ^b	35%	22%	16%	23%	41%	26%	—
Gender							
Female	DNC ^b	53%	56%	67%	57%	53%	54%
Family member ^c or self with asthma							
Yes	73%	65%	61%	70%	66%	65%	—

^a2006 data is based on an estimate of census data performed by Claritas, Inc.

^bDNC = Data not collected

^cFamily member was defined as child, spouse, parent, sibling or other

age, educational level, and socioeconomic status, were not collected to avoid the perception that specific groups were being targeted and to facilitate survey administration. The greatest familiarity with CAPP was reported in years 3 and 4, which correlates with the highest number of participants in CAPP interventions (Table 2). The survey’s achievement of a nearly representative sample, in terms of ethnicity and gender, of the population of 330,000 in the North Philadelphia communities served (as seen in Table 1) suggests that approximately 69,300 individuals (21%) had heard of CAPP which may have led to increased asthma awareness. These findings support the success of the project’s multidimensional intervention approach and media campaign to disseminate messages to increase community asthma awareness and knowledge.

DISCUSSION

This project’s findings demonstrate that a low-cost, community-based “street corner” approach is a feasible method for surveying a population that closely resembles the targeted population’s census data in terms of ethnicity and gender. The diversity of location types over the 5 years may have contributed to obtaining this representative sample of the targeted population. The use of students provided an inexpensive means of collecting data over a span of time from many locations and gave students experience with survey administration in an urban environment. Students received training in safety measures and throughout the 5 years none reported violent or dangerous incidents while administering the survey.

This street-corner methodology proved to be a feasible way to collect data in a congested, chaotic urban environment. The data suggested that the communication campaign, using local community resources, was effective in getting the word out about the CAPP program. Using this methodology, future studies which research key messages and how to target programs for select audiences would be helpful in public health programming.

The decrease in respondents’ familiarity with CAPP during the last year might be attributed to CAPP having closed enrollment in CAPP-sponsored interventions by the middle of year 5. CAPP had transferred responsibility for asthma-related services, such as asthma classes and home-based education and remediation, to community partners to ensure sustainability after the project ended. Thus, year 5 respondents might have been more familiar with asthma-related programs offered under the aegis of other service providers, such as local social service and faith-based agencies.

Limitations. The failure, because of privacy concerns, to collect certain key demographic variables, such as age, education, and SES, that might influence the

TABLE 2 Survey cumulative score differences in respondents familiar with CAPP and those not familiar with CAPP^a

	Mean score	Mean difference	P-Value ^b
Survey respondents familiar with CAPP	18.00±3.17	2.88±0.25	<0.0001
Survey respondents not familiar with CAPP	15.12±3.46		

^aFamiliarity with CAPP defined as answering that they have either heard of CAPP before or know someone who participated in a CAPP program
^bt-test was used to compare difference in scores

results, limited survey findings. Further, there was no baseline survey prior to CAPP implementation and no control community to compare survey outcomes. Obtaining quadrant representation proportional to the population for each of the 5 years would have been helped better to track the result of staggered implementation, with the expectation that later quadrants would have shown later increases in knowledge scores. Finally, no information was obtained regarding respondent's workplace, doctor's office, or school locations. Further validation of this method might include SES, age, and education and intentionally collecting a consistent number of surveys from each quadrant annually.

Lessons Learned. Student recruitment was critical. The key to successful recruitment was a partnership between CAPP and each class and instructor. Graduate and undergraduate school classes in nursing, social work, environmental sciences, and public health schools were targeted. CAPP offered instructors a didactic session on several topics including asthma, community participatory research, evolution of CAPP, or survey administration in the community in exchange for student participation. When an instructor agreed to participate, CAPP staff conducted a didactic training session in the class. Engaging classes in a "win-win" fashion may be helpful in recruiting students for other public health surveys.

CONCLUSION

The use of a street-corner methodology in inner-city neighborhoods succeeded in capturing a hard-to-reach audience. Using students in this low-cost feasible approach can potentially identify knowledge gaps, inform public health programming, and target public health messages for populations with the greatest health disparities. Partnerships with academic institutions provided the capacity to accomplish a great deal at a low cost. These partnerships also gave students experience with speaking to community residents about public health issues, conducting surveys, and learning more about asthma. Other communities might wish to apply lessons learned to assess the success of their efforts to promote broad-based community public awareness of health issues. Future randomized studies in communities with and without public health programs are needed to validate the street-corner methodology as an effective way to measure public health programming impact.

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