

# The Feasibility of a Street-Intercept Survey Method in an African-American Community

## ABSTRACT

**Objectives.** This study evaluates the feasibility of a nonquota, street-intercept survey method that utilized random selection of interview sites.

**Methods.** The street-intercept survey was compared with a random-digit-dial telephone survey conducted in the same catchment area among African-American adults aged 18 or older.

**Results.** The street-intercept survey's response rate was 80.2%; residence rate, 85.3%; interview completion rate, 97.9%; interference rate, 4.0%; and yield rate, 2.5 interviews per interviewer per hour. The street-intercept method produced more representative distributions of age and sex than the random-digit-dial survey.

**Conclusions.** The street-intercept method is a feasible alternative to traditional population survey methods and may provide better access to harder-to-reach segments of the urban population in a safe manner. (*Am J Public Health*. 1997;87:655-658)

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## Introduction

Traditional population survey methods may produce inadequate sociodemographic profiles in certain settings.<sup>1-5</sup> In low income and minority populations, random-digit-dial telephone surveys have demonstrated respondent bias due to disproportionate representation of persons of higher income, education, and employment levels.<sup>6-10</sup> Refusal rates are often higher with telephone methods,<sup>11,12</sup> particularly in younger African-American males.<sup>7</sup> Mail surveys are characterized by low response rates and similar biases.<sup>13-16</sup> Face-to-face interviews have higher response rates and greater participant responsiveness to interviewer questions.<sup>12,14</sup> However, in urban areas with high rates of crime, face-to-face surveys may be avoided or may result in biases overrepresenting higher socioeconomic community members.<sup>14</sup> Thus, populations at highest risk may not be adequately represented by traditional survey methods.

We evaluated the feasibility of a nonquota, street-intercept method, utilizing random selection of interview sites to access a representative sample of an urban African-American population. We compared the sample's sociodemographic characteristics with US Census data and with a random-digit-dial telephone survey from the same community.

## Methods

### Interview Sites and Process

Interviewing sites were based on the sampling unit of a block, defined as the length of a street from one intersection to the next intersection. All 3384 blocks in the catchment area were enumerated from census tract maps and were eligible for selection according to a computer-generated random-number list. Sampling noncontiguous blocks required frequent transportation of interviewers from block to block. To improve efficiency, we conducted interviews in an expanded interview site, defined as all blocks contiguous to the randomly selected

"index" block. This cluster sampling modification typically added 6 blocks to the interview site.

A team of six to eight indigenous, African-American, trained interviewers, and a field supervisor, were assigned to each interview site. Interviewers worked in pairs for safety, although each interview was conducted by a single interviewer; this allowed two interviews to be conducted simultaneously along a given block. Interviewer pairs moved from block to block until all eligible persons had been interviewed, typically taking 45 to 75 minutes per interview site.

The street-intercept method was designed to access all people on the street engaged in such activities as sitting on steps, walking to or from work, running errands, performing job-related duties, preparing to use public transportation, visiting, participating in recreation, or just "hanging out." Eligible respondents were African-American adults, aged 18 or older. Interviewers were instructed to approach the first eligible respondent they saw who was anywhere in the block as the interview period began.

For refusals, the interviewer recorded an estimate of the person's age, sex, and the stated reason for refusal. Interviewers were educated about how to avoid unsafe situations (persons who were intoxicated, exhibiting threatening behavior, or presumed to be involved in a drug deal). All interviews were conducted outdoors on weekdays, usually between 9:00 a.m. and 3:00 p.m., during the summer months of 1992 and 1993.

### Street-Intercept Instrument and Telephone Survey

The 1992 street-intercept questionnaire elicited information about sociode-

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**TABLE 1—Feasibility Criteria Results for Street-Intercept Survey Method**

	No.	Rate
Response rate <sup>a,f</sup>	416/519	80.2%
Residence rate <sup>b,f</sup>	355/416	85.3%
Interview completion rate <sup>c</sup>	973/994	97.9%
Interview interference rate <sup>d,f</sup>	21/519	4.0%
Interview yield rate <sup>e</sup> (interviews per interviewer per hour)	942	2.5

<sup>a</sup>Respondents consenting to be interviewed out of eligible respondents approached.

<sup>b</sup>Respondents with residence in catchment area out of respondents consenting to be interviewed.

<sup>c</sup>Interviews completed out of number consenting to be interviewed.

<sup>d</sup>Interviews interrupted or not started (owing to safety concerns) out of eligible respondents identified.

<sup>e</sup>Completed interviews per interviewer per hour.

<sup>f</sup>1993 survey only.

**TABLE 2—Demographic Characteristics of Street-Intercept Sample Compared with Random-Digit-Dial Telephone Survey and 1990 Census**

	% of 1990 US Census <sup>a</sup>	% Street-Intercept Sample (n = 942) <sup>b</sup> (95% CI) <sup>c</sup>	% of Random-Digit-Dial Telephone Sample (n = 928) (95% CI)
Male	43.8	50.7 (47.2, 54.2)	25.5 (22.7, 28.3)
Female	56.2	49.3 (45.8, 52.8)	74.5 (71.7, 77.3)
Age			
18–44	63.4	68.3	57.4
45–64	23.8	21.3	27.8
≥65	12.8	10.4	14.8
High school graduate, <sup>d</sup>	45.9	59.2 (55.9, 62.6)	59.1 (55.6, 62.6)
Employed	47.5	36.2 (29.3, 43.1)	58.9 (55.7, 62.2)
Not employed <sup>e</sup>	52.5	63.8 (56.9, 70.7)	41.1 (37.9, 44.4)
Income <sup>f</sup>			
<\$10 000	35.1	43.7	...
\$10 000–\$24 999	30.2	31.3	...
\$25 000–\$39 999	17.0 <sup>g</sup>	18.9	...
≥\$40 000	17.7 <sup>g</sup>	6.2	...

Note. CI = confidence interval.

<sup>a</sup>60 337 Black residents aged ≥18.

<sup>b</sup>Employment status and income assessed in 1993 survey only (n = 351).

<sup>c</sup>95% confidence intervals for street-survey variables reflect cluster-design effect.

<sup>d</sup>Persons aged ≥25 completing at least grade 12 or equivalent.

<sup>e</sup>Students, homemakers, retirees, and unemployed persons.

<sup>f</sup>"Household" income for US Census; "family" income for street method.

<sup>g</sup>Extrapolated from \$35 000 through \$49 999 category.

mographic characteristics and health status, including items on body image and perceptions of obesity (assessed with pictorial analogues<sup>17</sup>), smoking, and food consumption and a literacy assessment.<sup>18</sup> It consisted of 64 items and required 10 to 15 minutes to complete. In 1993, the questionnaire was increased to 91 items and took 15 to 20 minutes to complete.

A modified Waksberg method<sup>19</sup> was used to generate a list of random telephone numbers within the same census tracts used in the street survey. Eligible households were noncommercial African-American dwellings located in the catchment area with at least one adult aged 18 or older. To control for respondent bias, the interviewer asked to speak to the adult in the household with the most recent birthday. Interviewers tried all numbers up to six times, rotating the day of the week (Monday through Friday) and the time of day (morning, afternoon, or evening). The survey assessed sociodemographic characteristics using the same questions as the street survey and included items on smoking, diet, and health. Trained interviewers were supervised and were selected from the same pool of persons as the street-survey interviewers.

### Evaluation Criteria

To evaluate the feasibility of the street-intercept survey method, we assessed response rate, catchment-area residence rate, interview completion rate, interview interference rate, and, as an estimate of cost, interview yield rate (all defined in the footnotes of Table 1).

The survey examined representativeness by comparing sociodemographic characteristics of the sample to unadjusted US Census data for the same census tracts. Census tract data were obtained from the 1990 Census *Summary Tape File 1A*<sup>20</sup> and were converted to Epi Info<sup>21</sup> data files. Relevant denominators and rates were calculated. Comparison was also made with the population characteristics of the random-digit-dial telephone survey.

## Results

### Feasibility Criteria

A total of 994 interviews were conducted; 578 in 1992, and 416 in 1993. Interviews were conducted in all 30 census tracts, in 77 interview sites and in 395 different blocks. Results are presented in Table 1. Incomplete interviews occur-

red owing to the arrival of public transportation for which the respondent was waiting or the need to respond to a work demand. Eighteen interviews were avoided and three were interrupted because of perceived risks or threats (e.g., drug dealing, drunkenness, a man brandishing a knife, and rowdy behavior). Unsafe conditions in three interview sites caused the team to abandon the interview site before all potential respondents could be approached. In a fourth interview site, no interviews were conducted because potential respondents fled as the team members disembarked from their van. Sex and age distributions were not significantly different between respondent and nonrespondent groups. The response rate for the random-digit-dial survey was 61.3% (928/1514), and the interview completion rate was 85.6% (794/928).

### Sociodemographic Characteristics

Sociodemographic characteristics of catchment-area residents were compared with the random-digit-dial telephone survey and the 1990 US Census data for the same census tracts (Table 2). More men and younger respondents were accessed in the street survey compared with the

Census and random-digit-dial surveys. Both street-intercept and random-digit-dial surveys identified more persons with a high school education than did the Census. The street-intercept method underrepresented employed persons while the random-digit-dial survey overrepresented this group. Income distributions were shifted toward lower incomes in the street-intercept sample.

## Discussion

The street-intercept method was employed to capture a representative sample of the eligible population within a geographically defined catchment area. Street-intercept methods have been used with specific population sectors for focal studies of high-risk categorical problems only, such as transmission of the human immunodeficiency virus,<sup>22</sup> adolescent drug use,<sup>23</sup> and illegal drug sales.<sup>24</sup>

A population-survey method must be both feasible and representative if it is to be useful. The response rate of 80% in the street-intercept method is comparable to others<sup>22</sup> and superior to the 61% response rate of the telephone survey. The interview completion rate is higher in the street method, perhaps because respondents are less likely to break off a face-to-face interview with an indigenous interviewer.<sup>1,4,5</sup> The 85.3% residence rate indicates the method is fairly efficient in identifying residents of the catchment area.

Consistent with the literature, the telephone survey underrepresented men; 25.5% compared with an expected 43.8% in the Census. This was not a problem for the street method, where men were overrepresented. Both the street and the telephone surveys found higher educational attainment compared with the Census. While telephone surveys have been reported to overrepresent those with higher education, it is not clear why the street method would do so, although this has been found before.<sup>22</sup>

Employment rates vary among the three survey methods. Disproportionately high rates of employment among African Americans interviewed by telephone compared with in person have been found before.<sup>9</sup> In contrast, employed persons were underrepresented in the street method compared with the Census. Discrepancies in some demographic variables may also result from Census data limitations which result from undercount problems, especially in inner city areas.<sup>25</sup>

Small differences were also observed in income distributions measured in the street survey compared with those found in the Census data. Definition discrepancies may account for some of the difference, although finding more respondents with lower incomes is consistent with the higher numbers of unemployed persons identified in the street-method sample. We were able to assess income level in 93% of respondents in the street survey whereas in the telephone survey, congruent with other studies,<sup>10,11</sup> the nonresponse to this item was so consistently high that it was dropped from the questionnaire.

Several limitations of the street-intercept method are worth noting. Cluster sampling, while improving survey efficiency, typically introduces greater sampling error.<sup>26(p.204)</sup> We observed about a 1.8-fold increase in variance for the employment variable and minimal increases in other variables compared with what would be observed if the data were treated as a simple random sample. A second limitation is the potential for bias introduced by interviewers' passing by eligible, but "undesirable," respondents. This problem can be monitored with supervision and documentation of all interviews avoided for whatever reason. Such documentation would allow calculation of a nonresponse rate distinct from the refusal rate. Additionally, the method is dependent on fair weather, underrepresents the homebound, and may overrepresent homeless persons and the unemployed. Traditional survey methods often underrepresent or entirely miss homeless persons because they rely on a residence or a telephone. Indeed, being out on the street may be the only way to reach some population groups.<sup>24,27</sup>

Safety is a concern in most urban settings. The interview interference rate of 4.0% is low and may have resulted from interviewers and respondents feeling safer in public than if the interviews had been conducted in private residences.<sup>4</sup> Although there were no harmful incidents, the risk increases with larger surveys, and interviews were avoided during late afternoon and evening hours when interviewers perceived greater risks.

We conclude that the street-survey method is feasible, as evidenced by the 80% response rate, high interview completion rate, low interview interference rate, and a reasonable interview yield rate. The street method is likely to be most cost-effective in urban areas where members of the target population are geographically

clustered as was the case for this survey.<sup>28</sup> When eligibility characteristics are visually discernible, the method allows interviewers to identify potential respondents quickly, in contrast to mailed and telephone surveys.<sup>29</sup> Visual characteristics (race, gender, age) of nonrespondents can also be assessed, thus allowing for an estimate of response bias.

The method reached a broad sample of the target population on most sociodemographic indicators. Although some population groups such as the homeless and the unemployed may be overrepresented, the ability of the street-intercept method to survey those who are hard to reach can be considered an advantage. There is an increasing need to assess health status in persons who bear a disproportionate burden of disease, and the street-intercept method provides greater access to these groups. Thus, more complete assessments of the health issues in traditionally high-risk, urban, minority communities are made possible. □

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## 8th International Congress of the World Federation of Public Health Associations to Be Held in October 1997

"Health in Transition: Opportunities and Challenges" is the theme of the 8th International Congress of the World Federation of Public Health Associations (WFPHA). This meeting, hosted by the Tanzanian Public Health Association, will be held October 12 through 16, 1997 in Arusha, Tanzania. WFPHA is an international, nongovernmental organization composed of multidisciplinary public health associations representing 55 countries and regions. Congresses are held every three years.

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