Conducting Telephone Survey Research in Urban, Minority Communities: Strategies for Successfully Contacting Households for REACH 2010

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In this paper, we will provide an overview of the Racial and Ethnic Approaches to Community Health (REACH) 2010 program and its sample design. We will discuss the varying productivity rates of five regions of the urban REACH 2010 sample, including differences in the working residential number rate and in racial and ethnic eligibility to participate in this telephone survey. These findings may assist other researchers in sample planning, determining appropriate telephone call scheduling, and preparing post-data collection weighting plans. Further, we will describe the characteristics of the REACH 2010 respondents and variation of the survey's response rates. These descriptions will highlight the potential challenges others researchers may face in urban settings. Finally, we will explore ways in which to optimize contacts with urban households based on our REACH 2010 experience and present suggestions for efficiently contacting and interacting with households in selected urban areas.

What is REACH 2010?

REACH 2010 is the flagship program of the Centers for Disease Control and Prevention (CDC) designed to eliminate racial and ethnic disparities in health. It is a multi-year, community-based program targeting six health priority areas in five racial or ethnic minority populations. The health priority areas are: infant mortality, breast & cervical cancer, cardiovascular disease, diabetes, child & adult immunization, and HIV/AIDS. The five racial or ethnic minority groups on which the REACH 2010 program is focused are: African Americans, Native American, Hispanic Americans, Asian Americans, and Pacific Islanders.

In Phase 1 of the REACH 2010 program, CDC funded 32 community coalitions to assess their community's needs and develop a Community Action Plan (CAP) to address those needs as they relate to one or more health priority areas and one or more targeted minority groups. In Phase II, the CDC provided additional funding to 30 of these communities to implement and evaluate their community-level health behavior interventions. Twenty-four of these communities began implementing their interventions in 2001. Six communities began implementing their interventions in 2002.

NORC's Role

The CDC contracted with NORC, a national organization for research at the University of Chicago, to design and conduct a population-based, behavioral risk factor survey in 27 of the 30 communities. (Data used to evaluate the three communities targeting immunization or HIV/AIDS were obtained from a different source.) The purpose of the survey is to collect community-level, population-based data with which to evaluate the community-based health interventions. NORC developed samples for 27 communities and is currently conducting screening interviews to identify eligible households, and interviewing between 900 and 1,200 respondents in each community.

Respondents are considered eligible to complete an interview if they meet all of our project-specific screening criteria. Eligible adult respondents must:

- be contacted on a working, residential "land-line" telephone number;
- live in a pre-defined geographic area; and
- meet community-specific racial and ethnic eligibility requirements.

Sample Design

While the overall REACH 2010 data collection effort includes both urban and rural communities, this analysis is comprised of medium to large sized urban areas. Furthermore, in order to ensure large enough sample sizes in each area of interest, we combined data from multiple community areas into larger, multi-city regions. Specifically, we will refer to the following regions throughout the remainder of this analysis:

- **Northwest:** Seattle, Washington & Portland, Oregon
- **Southwest:** San Francisco, Los Angeles, & San Diego, California
- **Midwest:** Chicago, Illinois & Detroit, Michigan
- **Northeast:** The greater Boston, Massachusetts area & Bronx, New York
- **Southeast:** Atlanta, Georgia, Nashville, Tennessee, & New Orleans, Louisiana

While the REACH 2010 sample covers much of the United States, ours is not a nationally representative study. In order to contact respondents exposed to the unique community health interventions, REACH 2010 sampling frames vary in size from an entire state to specific census tracts.

Productivity and Eligibility of Sample

Our ability to conduct a successful telephone data collection in these urban areas is dependent upon not only the strengths of the survey instrument and the skills of our interviewing staff but also the productivity of the telephone sample. As noted earlier, all interviews must be conducted on a sampled land-line associated with a household. Once a telephone number is identified as residential the household and its adult members are screened for geographic and racial or ethnic eligibility.

While the larger REACH 2010 telephone data collection includes both random digit dial (RDD) sample and lists of known residential telephone numbers, we restricted this analysis to only RDD sample. As the proportion of listed telephone numbers varies across community samples and these numbers often yield more productive outcomes, we chose to examine only RDD lines to remove any bias in our results. Below, we discuss working residential number (WRN) and racial/ethnic eligibility rates of the RDD sample.

Working Residential Number (WRN) Rates. Table 1 below describes the total number of RDD telephone lines selected in each region and their associated rates. The WRN describes the

percent of all sampled telephone numbers that belonged to actual households and were in service at the time of data collection. Examples of numbers that are not considered working residential are businesses, faxes, modems, and out-of-service numbers. The WRN varies widely across regions with the highest levels being found in cities in California and the lowest in cities in the southeast. Therefore, in the latter region, greater numbers of telephone lines are required to identify a household.

Table 1. Productivity of REACH 2010 RDD Samples

	Number of Sampled Telephone Lines	Working Residential Number Rate	Racial/Ethnic Eligibility Rate
Northwest	**41,100**	26.0%	33.6%
Southwest	**22,854**	46.7%	31.9%
Midwest	**18,600**	30.3%	31.9%
Northeast	**18,000**	41.0%	69.8%
Southeast	**22,000**	23.0%	75.7%

Telephone lines are classified as being working or non-working residential numbers after a project-specific, predetermined number of call attempts. Therefore, households who have telephone service temporarily disconnected are at risk of being classified as permanently non-working if we attempt contact during the period of their disconnection. As rates of telephone service interruption are closely linked to household income, researchers of urban populations must be cognizant of the rate's impact on their sample and take steps to remove any bias through sufficiently rigorous call scheduling and post-data collection weighting procedures.

Table 2 describes the distribution of telephone interruption for the REACH 2010 RDD sample by racial and ethnic identification. This information is collected by household respondents whose telephone number was working at the time of contact. We have no direct information on the characteristics of households whose telephone numbers were identified as non-working at the time of data collection, but can make inferences from like households in a particular community.

Hispanic and Latino households were found to have the highest overall rates of service interruption during the 12 months prior to data collection. A majority of all interruptions, regardless of the racial or ethnic characteristics of the household were short term, lasting 2 weeks or less. However, a majority of respondents who self-identified as Asian or Pacific Islander reported the length of interruption as 1 week or less, compared to less than 40 percent of African American and Hispanic or Latino respondents.

Table 2. Percent of Households with Telephone Service Interruption in the Past Year			
	Yes	2 weeks or less	1 week
African American	4.9%	57.6%	35.2%
Hispanic or Latino	6.2%	61.7%	38.3%
Asian & Pacific Islander	3.4%	65.3%	52.0%

Racial and Ethnic Eligibility Rates. The second eligibility factor of interest to REACH 2010 is the racial and ethnic identification of household members. Each community has unique eligibility requirements and interviewers screen household to identify potential respondents who meet this criteria. Once a telephone line is determine to be residential, the interviewer will conduct a short screening interview with a single member of the household who is aged 18 or older. This initial respondent is asked to verify that the household meets specific geographic criteria and to enumerate each adult aged 18 or older who resides at that location, including their age, gender, race, and ethnicity.

Table 1 describes the variation in eligibility rates by region. While we are using an RDD sample to contact respondents in each community, the precise sample specifications are also unique. Therefore, our ability to reach households who are geographically and racially/ethnically eligible to participate depends on both the racial and ethnic residential clustering as well as the scope of the defined geographic area. While this analysis does not examine this interaction, we can hypothesize that, in the southeast for example, where the target group is African Americans, the high racial eligibility rate of 76% is strongly influenced by the rates of residential segregation among minority groups.

Respondent Characteristics

Despite using sophisticated sampling methodologies to identify both residential households and respondents within a known household, characteristics of participating respondents will not necessarily match those of others in the same community. For example, our experience on REACH 2010 tells us that women are more likely to be willing participants in survey research than are men, and that older adults also show more cooperation. Some of these biases can be offset through systematic scheduling of calls, including calling during evening hours when working-age adults are more likely to be at home. However, without instituting additional random selection protocols that can be both costly and time consuming, respondent participation is opportunistic. For instance, REACH 2010 intentionally oversamples females aged 40-64. However, if a call is answered by a man and both he and his wife who is 50 years old are selected for an interview, he may complete the questionnaire during the same telephone call, while it may take several attempts to reach his spouse, who may eventually refuse to participate. Therefore, despite selecting two individuals to interview, we may only be granted an opportunity to complete one. Next, we present the demographic characteristics the respondents who participated in the REACH 2010 telephone survey.

As seen in Table 3 below, the age distribution for respondents who completed an interview varies greatly by racial and ethnic group. More than one-fifth of all African American respondents were aged 65 or older, despite oversampling for women aged 40-64 years. In contrast, Hispanic or Latino respondents were much more likely to be young with almost half under aged 35 and close to 80 percent under age 50.

Table 3. Age of Respondent by Racial/Ethnic Group

	African American	Hispanic & Latino	Asian & Pacific Islander
18-24	10.0%	18.0%	8.6%
25-34	14.1%	29.7%	14.4%
35-49	28.1%	32.1%	32.4%
50-64	25.1%	14.6%	30.3%
65+	22.3%	5.3%	14.1%

In addition, we find that of REACH 2010 respondents:

- 63.2 percent were African American; 22.2 percent were Hispanic or Latino; and 14.6 percent were Asian or Pacific Islander.

- As expected, women of all racial and ethnic groups were more likely to participate. However, African American males were less likely to participate than other males.

- Hispanics and Latinos report lower levels of education than other minority groups with 49.5 percent having less than a high school education.

- African Americans were significantly less likely to identify themselves as a "homemaker" than other groups and more likely to report being retired. The latter can be partially explained by the earlier noted age distribution. We can speculate on possible community-specific meanings attached to the label of homemaker and how this concept may be interpreted differently by respondents.

- Respondents of Asian and Pacific Islander descent were less likely to provide information on household income, through both "refused" and "don't know" responses. Overall, 21.3 percent declined to answer this question versus 8 percent of African Americans and 10.8 percent of Hispanics and Latinos.

- 60 percent of Hispanic and Latino respondents reported household incomes of less than $25,000 as compared to 46 percent of African Americans, despite being more likely to live in multi-adult households.

- Less than 50 percent of Hispanic and Latino respondents completed an interview in English compared to more than 25 percent of Asian/Pacific Islanders despite having interviewers fluent in Spanish and multiple Asian languages.

Response Rates

Response rates serve as a critical indicator of quality of any data collection effort. A low rate of response can be a predictor of bias as survey participants may differ in characteristics than those who do not participate. While definitions of response rates are not consistent across the survey research industry, NORC uses standards approved by professional and academic organizations.[1] What follows is a brief definition of the types of response rates random digit dial surveys of households generally track.

Resolution Rate. RDD samples, by definition, consist of telephone lines whose purpose and status is unknown. The telephone number could be working and belong to a household, business, or fax machine; be non-working; or the status could be unknown even after multiple attempts. The process of identifying the status of a telephone line is often referred to as "resolving" telephone numbers. Therefore, the definition of a resolution rate can be described as:

$$\textbf{Resolution Rate} = \frac{\textbf{Number of Sampled Telephone Lines with Known Status/Function}}{\textbf{Total Number of Sampled Telephone Lines}}$$

It is generally reasonable to expect to resolve a high percentage of lines (e.g., 80 percent or higher). Telephone numbers used for businesses are often identified the most quickly and can be done so through calls made during daytime hours. Similar patterns can be found among lines used for electronic equipment such as modems or fax machines. More difficult determinations such as repeated "ring-no-answer" or "busy" call outcomes will require ongoing follow up at rotating day and evening hours.

Screener Completion Rate. Not all survey research studies will need to track a screener completion rate. In theory, a study that can interview any household member, regardless of age, gender, or other criteria will find this calculation unnecessary. However, given restrictions on interviewing anyone under the age of 18, at a minimum we would expect studies to screen potential respondents for age. It should be emphasized that the screener completion rate is not the rate of respondents who are deemed eligible based on screener results. Rather, as was true for the resolution rate above, this rate tracks whether or not the screener process was completed, regardless of eligibility outcome. Therefore, the screener completion rate can be defined as:

$$\textbf{Screener Completion Rate} = \frac{\textbf{Number of Identified Households where the Screener was Completed}}{\textbf{Total Number of Identified Households}}$$

[1] www.aapor.org

Note that the denominator of this rate is not the full number of telephone lines originally sampled, but rather only those identified as being residential. This illustrates the cumulative nature of response rates, how they interact, and how they build on one another progressively. It also shows how low rates and each stage can potentially bias survey outcomes.

Interview Completion Rate. Using a similar model as resolution and screener completion rates, we consider the interview completion rate denominator to include only cases which were determined to be eligible during household screening. Therefore, we calculate it as:

$$\textbf{Interview Completion Rate} = \frac{\textbf{Number of Completed Interviews}}{\textbf{Total Number of Possible Interviews}}$$

For REACH 2010, both the resolution and screener completion rates are "household" level rates. For example, a specific telephone line is identified as belonging to an individual household, and by extension, all persons living in that household. Once the line has been resolved as residential, the screening takes place on a household level as well, matching all residents against specific eligibility criteria. In contrast, the interview completion rate can be considered a person-level rate. Its denominator refers to all individual respondents who could possibly complete an interview, including multiple members of a single household unit. As the purpose of this analysis is to describe REACH 2010 participants, we are only presenting data on screener and interview completion rates. Specifically, we will describe any regional variation and then variation across interview completion rates by race/ethnicity and gender.

Table 4 demonstrates regional variation across rates. We were more successful in completing household level screeners in midwestern urban communities than in other regions. Interview completion rates were also slightly higher in this area. In comparison, respondents in northeastern cities were less willing to participate than those in other areas. Having an understanding of these disparities can allow researchers to better allocate their project resources and plan for commensurate refusal aversion and conversion efforts.

Table 4. REACH 2010 Response Rates by Geographic Area

	Screener Completion Rate	Interview Completion Rate
All Regions	49.1%	61.1%
Northwest	49.3%	54.9%
Southwest	45.5%	60.8%
Midwest	59.9%	63.3%
Northeast	49.8%	61.7%
Southeast	44.9%	62.3%

Table 5 further stratifies interview completion rates by reporting racial and ethnic identification within urban geography. Specifically:

- African Americans who live in midwestern cities were more likely to participate than those in other regions, with respondents in the northwest being least cooperative.
- Respondents of Asian and Pacific Island descent in the northwest were much less likely to participate than those in the southwest.
- Little variation is found among Hispanics or Latinos, regardless of region.

Table 5. Interview Completion Rate by Ethnic Group and Geography

	African-American	Hispanic & Latino	Asian & Pacific Islander
All Regions	61.0%	62.5%	59.8%
Northwest	55.1%	60.4%	51.5%
Southwest	59.7%	n/a	61.9%
Midwest	64.5%	61.2%	n/a
Northeast	59.0%	64.4%	n/a
Southeast	62.3%	n/a	n/a

NORC researchers have come to expect higher levels of cooperation from female respondents than from males. Our REACH 2010 experience supports this finding. With the exception of Asian/Pacific Islanders in the northwest, women consistently produce higher interview completion rates than do men (see Table 6).

Table 6. Interview Completion Rate by Ethnic Group, Geography, and Gender

	African-American		Hispanic/Latino		Asian & Pacific Islander	
	Male	Female	Male	Female	Male	Female
Northwest	49.0%	60.0%	53.4%	67.5%	53.8%	49.4%
Southwest	54.7%	63.5%	n/a	n/a	60.7%	63.0%
Midwest	54.5%	70.3%	55.5%	66.8%	n/a	n/a
Northeast	52.6%	63.2%	54.8%	70.9%	n/a	n/a
Southeast	53.4%	67.8%	n/a	n/a	n/a	n/a

African American females in all regions were more likely than African American males to complete an interview. Since the interview completion rate is based on the total number of eligible participants, our oversampling of female respondents is not impacting this result. A similar trend is present among Hispanic or Latino respondents. Overall variation among Asian and Pacific Islanders is much less pronounced and not consistent with the other groups.

Optimizing Contacts

Survey researchers hold several assumptions concerning optimal times to reach respondents.[2] [3] Anecdotal evidence has long shown weekday evenings and weekend days to be more productive than other times. We had no expectation that urban, minority respondents would differ in the timing of their participation, but reviewing this data provides additional knowledge to make data collection more efficient. Therefore, we proposed two research questions:

- Does the "best time" to call a household vary by race or ethnicity?
- When is the most productive time to contact "hard-to-reach" populations?

To answer these questions, we reviewed interview data and identified the day and time of the call in which the interview was completed. We did not include other contacts that might have resulted in an appointment, refusal, or some other non-complete disposition. When looking at all completed interviews across regions and racial/ethnic groups, we find the following day/time combinations to be the most productive.[4]

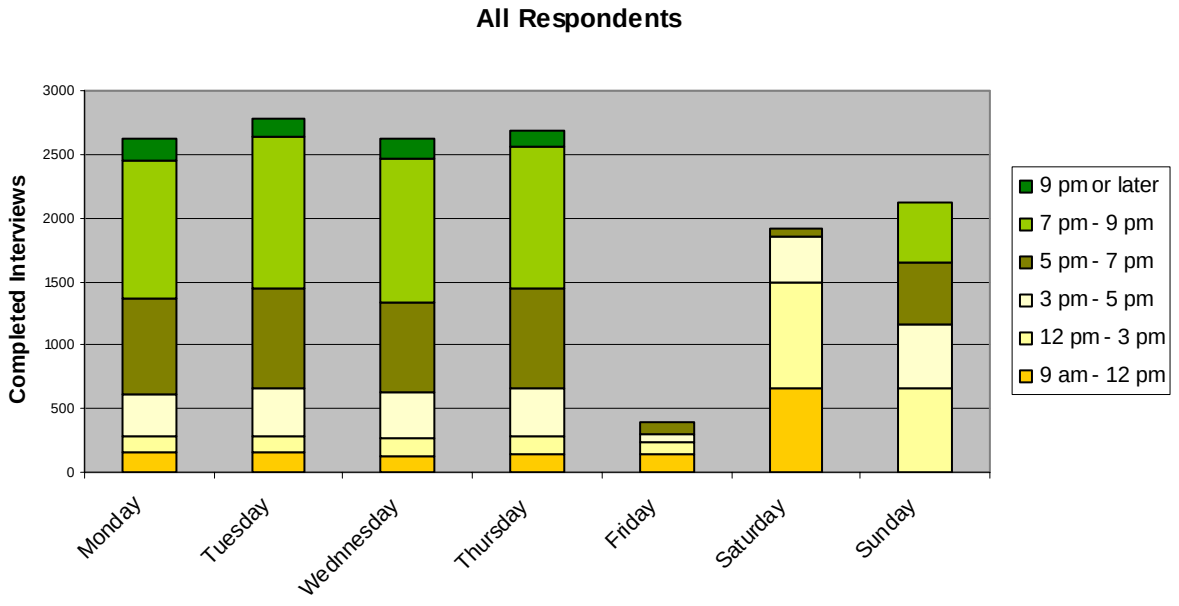
- Monday – Thursday, 5 p.m. to 9 p.m.
- Saturday, 9 a.m. to 3 p.m.
- Sunday, 12 p.m. to 3 p.m.

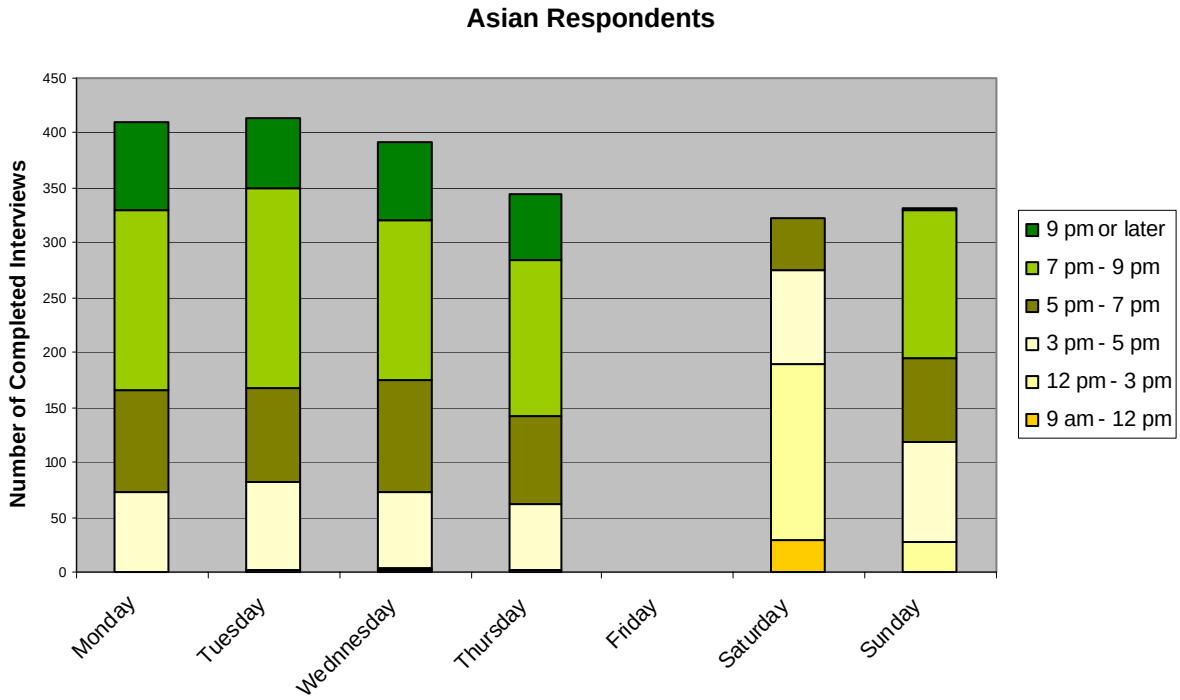
When reviewing timings for specific racial and ethnic groups we find little or no variation from the overall average among African American and Hispanic or Latino respondents. We do, however, find some differences among Asian and Pacific Islanders. Specifically, the successful weekday calling period begin earlier for this group with 3 p.m. as a productive time to begin on Mondays through Thursdays. This group also had high levels of participation after 9 p.m. on these days, a less productive time for other groups.[5] In addition, while calling African American and Hispanic or Latino respondents between 9 a.m. and 3 p.m. on weekdays yields a small number of completed interviews, contacting Asian and Pacific Islander households during those

[2] Greenberg, Betsy and L. Stokes, 1990. "Developing an Optimal Call Scheduling Strategy for a Telephone Survey." Journal of Official Statistics 6(4) 421-435.
[3] Kulka, RA and MF Weeks, 1988. "Towards the Development of Optimal Calling Protocols for Telephone Surveys: A Conditional Probabilities Approach." Journal of Official Statistics 4: 319-332.
[4] Please note that as we have historically found Fridays to be less productive than other days of the week, our staffing levels on this day are much lower than on other days.
[5] REACH 2010 interviewers do not initiate telephone calls later than 9 p.m. unless an appointment has been scheduled for that time.

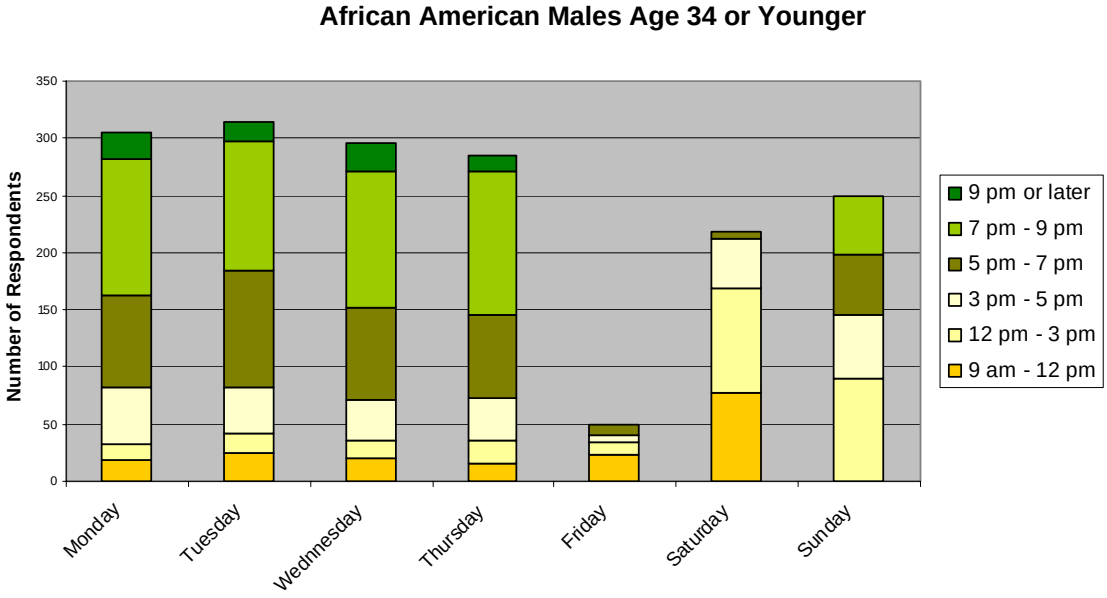
hours was not at all fruitful. The period from 9 a.m. to 12 p.m. on Saturday mornings was also not found to be productive in these communities. Lastly, these households were less likely to be responsive from 12 p.m. to 3 p.m. on Sunday, a timeframe that is effective in other communities.

The following graphs illustrate the overall calling trends and that for Asian and Pacific Islander communities specifically.





Lastly, we examined calling patterns of completed interviews among African American males ages 18 to 34. Gaining cooperation among this population has traditionally been difficult for REACH 2010. However, as demonstrated by the graph below, we found little variation in time completed interview between this demographic and the overall sample. We did note, however, that Saturdays from 9 a.m. to 3 p.m. were more productive for this population than others.



In summary, we found the following calling time periods to be productive when contacting these specific REACH 2010 demonstration communities:

Monday – Thursday: 5 p.m. – 9 p.m.

- Mornings may be effective for Hispanics and Latinos.
- Afternoons are successful for reaching Asian/Pacific Islander households.

Saturday 9 a.m. – 3 p.m.

- We were successful reaching young, African American males on Saturday mornings when we had interviewers with similar characteristics calling.

Sunday 12 p.m. – 9 p.m.

- Early afternoon is slightly more effective for African Americans, Hispanics and Latinos.

Interviewer Effects and Respondent Issues

After observing three years of REACH 2010 data collection during which time we systematically and routinely collected interviewer feedback on the data collection effort, we have identified several key factors in successfully contacting and gaining cooperation from urban REACH 2010 respondents. These experience-based lessons present key insights into effectively interacting with the REACH 2010 respondents and are most useful when coupled with the data presented above on optimizing telephone contacts. Below, we discuss interviewer characteristics and behavior and practices for properly addressing respondent concerns during interactions with the households.

Interviewer Characteristics. The effect of interviewer characteristics on the survey data collection process is well established in the methodological literature.[6] [7] [8] Our experience on REACH 2010 supports the notion that pleasing vocal characteristics of the interviewer such as tone, modulation, pace of speech and accent can help increase the likelihood of the respondent cooperating with the survey. This knowledge allows the interviewer, when possible, to customize their approach to match the potential respondent on these traits. Indeed, we have noted that, at minimum, interviewers who are well-prepared for and knowledgeable about the survey population which they are calling have a higher probably of achieving respondent cooperation. These lessons are embodied in NORC's interviewer training program and its real-time monitoring of REACH 2010 interviewers' work.

Respondent Concerns. Several issues have emerged related to respondent concerns which must be successfully managed during data collection. During the telephone interviewers' introductory script, respondents are informed of the CDC's sponsorship of the REACH 2010 program. While interviewers have been fully trained to handle respondent inquiries and are adept at fielding any questions related to the survey and its sponsor, informing the respondent of CDC sponsorship has led to respondents expressing some concerns. Most notably, during the anthrax scare of 2001 respondents expressed concern that they, their family or their community might be at risk for a disease or health condition because of the CDC's association with the telephone call they received. As a result, we temporarily discontinued mentioning CDC as the study sponsor and instead provided NORC's University of Chicago affiliation.

Some respondents have articulated concern that any government-sponsored benefits they receive (such as Social Security benefits or unemployment compensation) may be jeopardized if the respondent refuses participation in the REACH 2010 study, while others have expressed a general distrust of government-related programs. While the frequency of such responses is

[6] Edwards, W. Sherman, 1993. "Effect of Interviewer and Respondent Characteristics on Reporting of Chronic Conditions." Proceedings of the Survey Research Methods Section, American Statistical Association.

[7] Fowler, Floyd and T. Mangione, 1986. "Interviewer Characteristics and Nonresponse." Proceedings of the Survey Research Methods Section, American Statistical Association.

[8] Wolford, Monica et al. 1995. "Bias in Telephone Surveys of African Americans: The Impact of Perceived Race of Interviewer on Responses." Proceedings of the Survey Research Methods Section, American Statistical Association.

small, it is important to recognize the broad scope of potential respondent concerns and develop protocols for addressing them.

Finally, it is important to note that cultural differences can also inform the types of issues encountered from respondents. It is crucial to understand differing social and cultural mores and their impact on gaining respondent cooperation. For example, among the REACH 2010 Asian and Pacific Islander respondents, we find that additional time is required to complete surveys as non-scripted interactions (such as social pleasantries) are more likely to occur among this type of respondent. Further, interviewers require additional training about and must be highly cognizant of respondent concerns related to personal questions related to health. Overall, more overt signs of respect for older respondents are required in these populations.

Conclusions

In conclusion, we have presented the variation found in five regions of the urban REACH 2010 survey sample in regard to working residential number rates and racial and ethnic eligibility. We found that Hispanic and Latino households are most likely to have had an interruption in telephone service than any other REACH 2010 racial or ethnic group. Women are more likely to participate in the survey while African American males are least likely to participate. The midwestern region consistently has the highest response rate for screening and completing the survey. We also highlighted particularly productive days and times of day to call the urban areas of the survey population, noting differences among the racial and ethnic groups. Finally, we discussed how interviewer behavior and characteristics can affect respondent cooperation and cultural differences can impact the length of survey administration and success in gathering personal information from respondents.