

Practical Steps to Conducting Cellular Telephone Surveys

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Abstract

The population of cell-telephone-only households has increased rapidly in recent years, and further growth is expected. To meet this growing challenge, NORC at the University of Chicago conducted the National Immunization Study's Cell Telephone Pilot study to explore the possibility of integrating cell-phone-only households into the National Immunization Survey (NIS). The effort included focus groups and four surveys of cell-telephone subscribers during 2007; the last two surveys were conducted as experiments for the National Immunization Survey. We discuss practical issues of survey methodology faced and solved in these surveys, including dialing protocols, call outcomes, respondent compensation, interview length, and the introductory script.

The NIS is a nationwide, list-assisted Random Digit Dial (RDD) survey sponsored by the Centers for Disease Control and Prevention. Designed to facilitate monitoring of vaccination rates for children age 19 to 35 months, the NIS conducts approximately 24,000 household interviews annually. The NIS also uses a provider follow-up survey.

Key words: Cell Phones, National Immunization Survey

Introduction

The growth of cell phone usage poses a new and interesting set of challenges for survey research. Historically random digit dial telephone (RDD) surveys have sampled landline households only, but today RDD surveys are subject to increases in non-telephone coverage bias when cell-phone-only households are excluded. The increase in bias may call into question all surveys that exclude cell-phone-only households. The National Health Interview Survey showed cell-phone-only status to be associated with sex, age, income, housing tenure, and household composition. Persons who live in cell-phone-only households were more often male, of young age, living below poverty, renting their home or apartment, or living alone or with unrelated adults. Surveys that target young adults or young families with children can no longer ignore the continuing increase in cell-phone-only households. Efforts are needed to evaluate the feasibility of including cell phone users in RDD surveys.

In 2007, NORC conducted a series of experiments among cell phone users. The purpose of the experiments was to evaluate the feasibility of conducting household interviews among cell phone users as part of the National Immunization Survey (NIS) sponsored by the Centers for Disease Control and Prevention (CDC). The NIS is traditionally a nationwide, list-assisted RDD survey based on a landline sampling frame to identify households with children aged 19 to 35 months for childhood vaccination information. The experiments were designed to incorporate cell-phone-only households into the NIS to ultimately reduce non-coverage bias, but also to identify other sampling and interviewing issues for a national RDD, list-assisted telephone survey that includes both landline households and cell-phone-only households.

Methods

NORC conducted a series of cell phone research experiments for the CDC. Each experiment was organized to inform subsequent experiments. A literature review was conducted to identify legal and sampling issues associated with cell phone use, and relevant interviewing procedures. Focus groups of cell phone users were also conducted.

Cycle 1

The objective of the Cycle 1 cell phone experiment was to identify the process of gaining survey cooperation among cell phone users and the dos and don'ts of cell phone interviewing. Respondents were offered \$10 to participate. The screener confirmed whether users were 18 years of age or older, were not driving at the time of the call, and whether they used their cell phone primarily for personal use rather than business use. Respondents were asked about their experiences with cell phones, and the types of surveys they would respond to on their cell phones. Demographic information was also collected, including household addresses for mailing the \$10 compensation for participating in the experiment. Ninety-nine cell phone interviews were completed in Cycle 1 (conducted from April 19 to April 30, 2007) from a sample of 3,200 cell phone numbers.

Cycle 2

The objective of the Cycle 2 cell phone experiment was to refine the cell phone protocol implemented in Cycle 1. Rather than ask if respondents were driving at the time of the call as done in Cycle 1, in Cycle 2 the screener asked if respondents were in a "safe and private place" at the time of the call. Survey questions from Cycle 1 were streamlined to improve their use in Cycle 2, and four new questions were added. These included number of doctor and dental visits in the past 12 months, the month and year of the last doctor's visit, and the type of visit. A household roster was added to collect age and gender information for each adult in the respondent's household. Respondents were asked about the different ways they could be reached by phone—including any landline telephones, how many landlines could reach them, whether they had access to another cell phone, and the number of cell phones regularly used. In Cycle 2, 239 cell phone interviews were completed from June 7 to July 5, 2007, from a sample of 6,450 cell phone numbers.

Cycle 3

The objectives of the Cycle 3 cell phone experiment were to incorporate lessons learned from cycles 1 and 2 into a cell phone protocol for the NIS and evaluate whether cell phone users would respond to a national survey on childhood vaccinations. The experiment was conducted from August 14 to September 22, 2007. Twelve

interviewers previously trained on the NIS were used for Cycle 3. The sample of cell phone numbers was purchased from Survey Sampling Inc. and included only cell phone banks in the state of Illinois. Respondents were offered a \$10 incentive for participation in the survey. During the introduction, respondents were told that the survey was about childhood immunizations. From a sample of 9,300 phone lines, 26 cell phone interviews were completed; 24 respondents gave consent to contact the provider for immunization records. Interviews were completed on average within 11 minutes.

Cycle 4

The objective of the Cycle 4 cell phone experiment was to increase the size of the cell phone sample and implement lessons learned in prior cycles. A number of problem areas was identified during Cycle 3 interviewer debriefing and data review. To address the problem areas, the monetary incentive was offered to all respondents; the introduction was modified to reduce early break-offs; and the words “safe and private” were changed to minimize negative or suspicious reactions during the introduction. Health insurance questions were added and the standard provider record check (PRC) component of the NIS was implemented. Cycle 4 began in November 2007 and was intended to be conducted for six weeks. The experiment was stopped temporarily to modify the survey’s protocol, which had resulted in increased time and effort to complete a cell phone interview compared to previous cycles. At the time the experiment was stopped, 30 interviews were completed with a 100% provider consent rate. A modified Cycle 4 experiment began on January 28, 2008, and included a change to the introduction to reduce the “sales call” feeling respondents reportedly experienced at the start of the call. The monetary incentive for survey participation increased from \$5 to \$10. Survey participant eligibility criteria were expanded to allow fathers and male guardians of eligible children to complete the survey. Sixty-five completed interviews were expected from the last half of Cycle 4’s experiment, but 97 interviews with a provider consent rate of 96.9% were completed.

Results

Cycles 1 and 2 Results

Almost all respondents across the cycles (94.4%) report leaving their cell phone on most of the time or always. Respondents report that the longest time spent on a cell conversation averages 90.8 minutes. More than half (55.8%) of respondents reported placing most of their calls when their minutes were free. Most respondents were at home when they completed the survey (52.6%). Another 14.4% were at work. Sharing of cell phones was relatively prevalent with 65.8% reporting that their cell phone was used by at least one other person. Cycle 2 data shows that approximately 20% of respondents were contacted in a time zone other than the expected one based on area code information.

Respondents’ willingness to complete a survey varied widely with the purpose and sponsor of the survey. Very few respondents (2.5%) stated that they would refuse to give out medical information over the cell phone.

Cycle 2 questions regarding whether a respondent would hand over the phone to another household member indicated that 45.8% would request a call back to talk to the other person while 16.7% would turn the phone over immediately.

Cycles 3 and 4 Results

As the provider information is the cornerstone of the NIS, the question of whether respondents would be willing to provide provider information and consent via cell phones is an important one. Cycle 3 proved that respondents showed no significant signs of concern or discomfort resulting from completing the interview on cell phones. In addition, it was surmised that because cell-phone-only households are skewed toward younger adults, the eligibility rate realized may be higher than the traditional RDD. Because the eligibility criteria for the cell phone experiment differed from the NIS, a direct comparison cannot be made in Cycle 3.

One concern at the outset of Cycle 4 related to potential effects relating to the time of year the experiment was conducted in. Cycle 4 dialing rates weren’t problematic as compared to Cycle 3 but the time to complete an interview nearly doubled and the first half of the sample realized 30% of completes instead of 50%. Further, all

rates except consent and the screening rate decreased from Cycle 3 to 4. The consent rate was 100%, and the screening rate showed a 1% increase over Cycle 3.

Cycle 4b proved a much more successful venture. The eligibility criteria were changed such that it matched the NIS-Child, and the eligibility rate increased by 1.1% over Cycle 3 and 1.6% over Cycle 4; it was also greater than the NIS by approximately 0.6%. The resolution rate and screening rate increased in Cycle 4b. The interview completion rate was higher than Cycle 4 but lower than Cycle 3 and the NIS-Child. Interestingly, there were many partial interviews, and interviewers reported that they frequently encountered respondents who were willing to continue the interview but did not have the provider's contact information with them. This may be related to the portability of cell phones.

Discussion

Cell Phone Challenges

Gaining cooperation

The introduction to a survey is one of the most important sections because it can make or break respondents' decision to participate. All interviewing efforts, regardless of sample type, necessitate having respondents willing to stay on the line long enough to hear what the interview is about and decide that it's worth their time. Because much of the population believes their cell phones are "safe" from surveys and other business-related calls, interviewers have the added task of overcoming objections levied by cell phone users. In each cycle, the introductory text was modified based on interviewer feedback and review of recordings. All iterations began with who was calling the cell phone and why. In the last cycle, respondents were told the survey's length (that it would take less than two minutes to determine whether they qualified for the study).

The mention of monetary compensation early in the survey suggested to respondents that the call was a sales-related call. This was then moved to the end of the introduction section. Based on comments made by respondents, there was also reason to believe that the \$5 incentive was not appropriate to cover respondent efforts given that the interviews were lasting longer than planned. Compensation was increased from \$5 to \$10. Debriefings revealed that the single most common objection or question from respondents was the use of their cell phone for survey purposes; respondents wanted to know why the call was made to their cell phone. To address this concern, a statement was added early on in the introduction stating that the study is to be conducted among cell phone users. Feedback from the second half of Cycle 4 indicated that respondents seemed more cooperative. Since these three changes to the introduction were made at the same time, it is not possible to show which had the greatest impact.

Overcoming resistance

A second challenge was convincing respondents to listen long enough to the introduction in order to give interviewers the chance to say what the call was about. Respondents' first reactions were to inform the interviewer that the call was made to a cell phone. Interviewers would explain that the call was intended for cell phone users.

Ensuring safety

The third challenge was ensuring safety of respondents at the time of the call. Cell phone users can answer callers regardless of where they may be at the time of the call. Because of the portability of the cell phone, users may be engaged in activities that require full attention to avoid safety risks. A question was included in the screener to confirm that respondents were not driving or engaged in an activity that required their full attention at the time of the call. Respondents made the determination of whether they were engaged in an activity that required their full attention. Respondents who reported that they were driving or attending to an activity were scheduled for a call back.

Length of interview

The full NIS-Child interview takes approximately 20 minutes to complete. We assumed, for the early phases of experimentation, that a shorter questionnaire would be better received by respondents on cell phones. The interview

was to be about 8 minutes of questions. The actual administration time was 11 to 13 minutes. The difference between the planned and actual time reflects the fact that interviewers and respondents sometimes spent significant time discussing the fact that this was a cell phone. Further, the time for Cycle 4 increased slightly due to the addition of the Health Insurance Module (see Questionnaire section for discussion of the HIM). Interestingly, during debriefings interviewers perceived that interviews were taking in excess of 15 to 20 minutes. It may be that the significant refusal-aversion efforts resulted in a skewed perception of interview length.

Survey Implementation

Questionnaire

As noted previously, the length of the interview was surmised to be of even more importance on a cell phone than on a landline phone because respondents may be sensitive to using their minutes. As such, the NIS questionnaire was trimmed with some sections remaining the same as the NIS and other sections being replaced with completely new questions.

The screener was modified to ask whether the respondents were driving or engaged in activity that required their full attention. After respondents indicated that there were children between 12 months and 3 years of age, they were asked a series of questions to determine whether a mother or female guardian usually used the cell phone. In Cycle 3, eligible respondents included only mothers or female guardians who were usual users of the cell phone. This protocol was followed to avoid the problem of passing cell phone from user to user. The NIS age criterion for eligibility was the same in the NIS cell questionnaire.

After the screener, the NIS interview launches into a section designed to gather detailed information on immunizations received. For respondents who have the child's shot record available, questions are detailed and include how many times each type of shot was received and the dates for each. For those without shot records, the questions ask whether the child has received each shot. To impose as little respondent burden as possible, the NIS Cell used a modified version of the latter section. The section was reduced from 12 to 6 questions and included simple yes and no questions to determine whether the child received certain immunizations.

The remainder of the NIS interview includes demographics, immunization provider questions, and a health insurance module. The NIS Cell questionnaire included, in order, provider questions and demographics in Cycle 3, and provider, demographics, and the health insurance module in Cycle 4.

The provider section of the questionnaire was not modified for the cell questionnaire. One of the cornerstones of the NIS is the detailed immunization data collected from providers. One of the questions of interest in the cell phone experiment was whether respondents would be more or less likely to give consent over cell phones to contact providers. We found that consent rates were 96% or higher for each cycle. The demographics section of this NIS was trimmed considerably to include only those questions relating to phone availability or those needed for weighting the data. The Health Insurance Module typically runs approximately 90 seconds during the NIS interview. Because it is so short, it was not modified for administration to cell respondents.

Dialing protocols

A significant difference between cell and landline dialing lies in the dialing protocols. By law, cell phones cannot be dialed using an auto dialer. As a result, interviewers were presented with a phone number that they manually entered. The CATI system checked to be sure the number presented and the number dialed by the interviewer matched before completing the dial. This was in an effort to minimize errors in keying phone numbers. The dialing efficiencies resulting from using the auto dialer are decreased by about 50% when comparing the NIS to the cell phone work.

Call outcomes

Cell phones necessitate different considerations than landline phones where call outcomes and calling rules are concerned. The messages received when calls are made can vary by carrier and can have multiple meanings. It became necessary to direct interviewers on how to code certain messages into already existing outcome categories

as well as create some additional codes. Interviewers required ongoing feedback as new messages were received during the field period. The cell phone specific codes included:

- Other Technological Circumstances – audio quality too poor to continue
- Other Technological Circumstances – dropped call
- Mailbox is full
- Mailbox not set up
- Out of range/Out of area/Out of coverage/Roaming
- Cell phone temporarily not working/unavailable
- Number cannot be reached from our calling area
- Telephone number does not accept incoming calls
- Request for PIN, credit card
- Number not assigned
- Number not in service

In addition to call outcomes is the issue of appropriate delays for cell phones. In the absence of strong rationale for modifications, the NIS calling rules were applied to the cell phone experiment. The poor audio and dropped call cases were called back in ten minutes. The remaining cell-specific codes were treated like answering machines, faxes, and disconnects. Within the cycles, calling rules were not modified as the initial phases of cell work have revolved around implementation and how to engage respondents. More investigation is needed to determine where differences in delays are necessary.

Compensation and Token Payments

The cell phone experiments included monetary compensation in two forms. A small offer of compensation was made at the introduction to show appreciation for the respondent's time. Initially this offer was made to only eligible households; however, this was broadened in Cycle 4. In addition the amount was increased from \$5 to \$10 when Cycle 4b began.

Token payments were offered in a way that was similar to the NIS process. The NIS offers token payments to households where a refusal is received after it's determined that they are likely to be eligible. The "nearly eligible" status is defined as having at least one child in the household between 12 months and 3 years of age. These households are offered a total of \$15 for their continued participation. When we have an address for a household we send \$5 with a letter promising \$10 additional dollars for continuing the interview. Households without an address are informed on the next call to the household that they are eligible for a \$15 token payment.

For the cell phone interview, households with children between 12 months and 3 years and, in Cycle 3 and 4, with a mother/female guardian who was the usual user of the cell line were considered nearly eligible. We did not have addresses for any cell phone cases, so all offerings of token payments were made on the first contact made after the refusal call.

To receive the compensation or the token payment, respondents were required to provide a mailing address. Up to one-third of respondents refused the compensation by refusing to provide a mailing address. No token payment cases refused to provide an address.

Lessons Learned and Future Research

There is much to be learned about how to effectively utilize cell phones in RDD samples. NORC's early research suggests that while there are challenges in gaining cooperation and overcoming resistance, it is possible to move beyond the objections to complete interviews. And, by doing so, we are ultimately able to include respondents who would otherwise be excluded from participation. There is still much work to be done regarding surveys on cell phones, including finding the optimal interview length that will maximize the volume of data without unnecessarily burdening respondents; developing appropriate call outcomes and designing calling rules to maximize contacts and completed interviews; and understanding the role token payments and compensation play for cell users.