Survey Practice This Month

Wednesday, February 25, 2009, 7:20:26 AM | Editor

Unlike the previous two issues of Survey Practice that focused on one topic, this issue has three articles on different topics. First, Michael Link and colleagues describe the research they conducted looking at cell phone telephone number samples and address-based sampling. Next, Mohamed Qayad and colleagues describe a project where they extended the field period and made extra call attempts in the BRFSS. In the third article, Sean Hogan shows that pre-paid incentive checks were cashed almost entirely by survey participants.

As always we welcome your comments on Survey Practice.

John Kennedy   Diane O'Rourke
David Moore   Andy Peytchev

Comments: 0

Comments

Addressing the Cell Phone-Only Problem: Cell Phone Sampling Versus Address Based Sampling

Wednesday, February 25, 2009, 7:18:38 AM | Editor

Michael W. Link, Gail Daily, Charles D. Shuttles, H. Christine Bourquin, and L. Tracie Yancey
The Nielsen Company

Developing cost effective methods for reaching households which no longer have a landline but do have access to a cell phone, so called cell phone only households, is a critical item on the agenda of most data collection organizations. To date, two methodologies have emerged as potential means for addressing this issue. The first involves sampling telephone numbers from known cell phone exchanges and calling these numbers or combining these with a sample of landline numbers in a dual frame design. An alternative approach involves sampling of addresses rather than telephone numbers. Address based sampling (ABS) is a new technique built upon the use of large scale address databases. These addresses can be reverse-matched to commercially available databases to identify a relatively large proportion of telephone numbers, facilitating the use of mixed-mode approaches. Here we delineate and compare the advantages and limitations of these two approaches, including discussion of sampling and weighting approaches, operational considerations, timeliness, and cost.

Twilight for Landline Random Digit Dialing

For nearly three decades, landline-based random digit dialing (RDD) enjoyed preeminence among survey methodologies, facilitating high quality, quick turn-around, computer-assisted interviewing that met the needs of most researchers and clients. Yet, with the dawn of the 21st century, issues first noted in the late 1990s became true problems. First, the sheer number of telephone numbers increased leading to significant declines in the "hit rate" for residential numbers in telephone samples, increasing the cost and difficulty of identifying working household numbers. Next was the decline in response rates for landline RDD surveys, dropping approximately 2-3 percent per year since the mid-1990s and increasing concerns about the representativeness of the data collected using RDD methods. Third, the growth and popularity of cell phones has irrevocably altered the landscape of telephone survey research, with nearly one-in-five US households being cell-phone only, a proportion which is substantially higher among groups such as renters and younger adults (Blumberg and Luke, 2008). Finally, new research indicates that the common practice of excluding zero listed landline banks to improve operational efficiency in RDD surveys may not be as benign as previously thought, with a higher than expected proportion of unlisted, residential landline numbers now being identified in these banks (Fahimi, Kulp, and Brick, 2008). All told, coverage of the landline telephone frame has decreased to pre-1970s levels.

Researchers, data users, and clients who have come to depend on landline-based RDD find themselves at a crossroads. The problems with landline RDD methodology will not be fixed through the use of incentives, advance mailings, additional telephone calls, oversampling, or any of the many techniques designed to improve participation with this methodology. What is needed is a complete re-engineering or even re-imagining of how researchers go about the task of sampling to conduct cost-effective surveys of the general public. Two potential options have emerged: (1) combining cell phone exchanges with landline exchanges in a dual frame approach, or (2) turning away from dependence on telephones as the primary sampling unit and moving instead to sampling of addresses. We consider some of the major arguments for and against these two approaches.

Dual Frame Sampling with Cell Phone Numbers

One potential solution is to sample from known banks of cell phone numbers, combining this sample with the landline sample in a dual frame approach. The combination of the two frames should significantly improve coverage, but would still exclude households with no telephone access and those with unlisted landline numbers in banks not typically sampled by survey researchers. The dual frame approach has a number of other potential benefits. First, it allows researchers to continue to use computer assisted telephone interviewing (CATI) as the primary vehicle for conducting telephone surveys, facilitating use of complex questionnaires and the conduct of quick turn-around surveys. In terms of sample costs, the per unit cost for cell phone numbers is only slightly more than that of traditional landline samples.

Unfortunately, sampling and contacting households by cell phone faces a number of challenges, some severe. First, the sampling frame of known cell phone numbers is an inefficient one, containing a large, but unknown, number of cell phone numbers which are either not in service or in service but rarely used or answered. As a result, researchers must either make a large number of calls per case or sample a larger number of cell phones in order to reach an individual. Cell phones may also not be in use in the geographic area from which they were sampled. Potentially more problematic, the cell phone frame is rather barren in terms of additional information about the number, such as associated address, name, projected demographic characteristics, etc. As a result, frame stratification is limited and some of the common features of modern telephone surveys, such as the ability to send advance letters to homes before a telephone call, are not possible at all.

The dual frame approach also poses a number of operational challenges. Initial contact with cell phone households is limited to telephone contact, limiting the use of other modes during the contact/recruitment phase of a study. Participation in cell phone surveys is already quite low and can only be expected to decline further over time. Additionally, the cell phone must also be viewed as a new mode, with potential uses and constraints that differ from traditional landline interviewing. Some of the areas which require further clarification through research include:

* the optimal questionnaire length;

* the level of “cognitive engagement” of respondents interviewed by cell phone, particularly when multitasking or being interviewed while driving or shopping;

* lack of a common set of disposition codes to cover situations which may be unique to cell phone interviewing (although work in this area is progressing);

* clarification of response rate calculations, in particular the determination of the percentage of uncontacted numbers which should be estimated as eligible households and, therefore, be included in the denominator of a response rate; and,

* the applicability of within household randomization with cell phone interviewing, that is if the devices should be treated as individual or household devices, and how to handle selection within a cell phone only household in which an eligible sample member does not have their own cell phone and, therefore, would be excluded from inclusion in a study.

One particularly vexing issue is the lack of universe estimates or population parameters against which to weight survey data. This is especially problematic at the sub-national levels (state, county, city, etc.).

Surveys conducted via sampling of cell phone exchanges are also much more expensive to conduct than the costs associated with a landline survey. Studies have reported the costs to be nearly twice as high when screening for cell phone-only households was not conducted and nearly four times as great when such screening was used to identify cell phone-only households (Link et al 2007; Keeter et al 2008).

Cell phone interviewing also involves certain legal and ethical considerations that do not apply to traditional landline interviewing. For instance, the Telephone Consumer Protection Act and the FCC’s implementation (71 Federal Reg 21634, April 26, 2006) prohibit machine-based dialing of cell phone numbers without prior consent from the respondent. These numbers need to be dialed by hand, thereby making them more expensive for many survey organizations and impractical for organizations dealing with very large samples sizes. With cell phone interviews it is imperative to ensure that respondents are in a safe location or situation before proceeding with the interview. Finally, many US cellular calling plans require the cell phone subscriber to pay for incoming calls, which raises a number of ethical and legal issues associated with soliciting cell phone subscribers without appropriate financial compensation.

In sum, it seems clear from the flurry of research in this area that many survey researchers who currently conduct landline RDD surveys are hopeful that a dual frame landline/cell phone approach can be developed to deal with the growing coverage crisis in landline RDD surveys. It is clear, however, that such an approach faces an array of obstacles. The approach may have short-term appeal, but its long-term prospects are still unclear.

Address Based Sampling (ABS)

As an alternative, researchers have looked to a completely different approach: address based sampling, that is, the use of addresses as the primary sampling unit drawn from a computerized frame of address listings (Link et al 2006; Link et al 2008). In particular, the Delivery Sequence File (DSF) used by the U.S. Postal Service (USPS) has proven most promising. The DSF is a computerized file that contains all delivery point addresses serviced by the USPS, with the exception of general delivery (USPS 2005). Each delivery point is a separate record that conforms to all USPS addressing standards, thereby facilitating the drawing of samples from any geography within the US.

When considering all types of addresses, the DSF provides approximately 98% coverage of residential households, thereby providing a means of sampling landline and cell phone only households, as well as providing access to households with no telephone, newly emerging VoIP-only based computer phones, and those in less efficient landline telephone banks (e.g. zero listed banks). Because addresses are in a fixed location, telephone portability is not an issue.

Another important benefit is the rich amount of information that can be matched to an address, facilitating more complex sample designs and providing information for enhanced contacting and recruiting approaches. A majority of addresses can be matched to a landline telephone number via commercial databases, thereby facilitating multiple modes of contact. Survey sample vendors can typically provide case-level variables such as household name, Spanish surname indicator, estimated age of head of household, as well as geocoding and attachment of Census tract information such as the percentage of racial/ethnic groups within a particular geography, median household income of the area, and in some cases even email addresses. These variables can be used in a number of ways to enhance the survey design, such as through sample stratification on key variables, advance mailings to households, and tailoring of materials, contact scripts, or incentives based on household characteristics such as likely age, race, or ethnicity of the head of household.

ABS facilitates a range of potential survey designs, including single mode mail surveys to all sampled addresses; or a mail invitation to complete a mail or web survey; or, a dual mode design with mail surveys to all households (or just those with no matched telephone number) and telephone follow-up (or first contact) for those with an identifiable telephone numbers; or a more complex mix of mail, Web, interactive voice response (IVR), and outbound or inbound telephone. This gives researchers greater flexibility to match survey mode with the goals and target population for their study.

Weighting and post-survey adjustments can follow traditional survey procedures as population totals or universe estimates are readily available at the level of most commonly used geographies (national, state, county, etc.). Further, because of the near universal coverage the weighted data should more representative of the larger population from which the sample was drawn provided there is little or no systematic bias due to nonresponse.

In terms of cost, an equal number of sampled addresses are about twice as expensive as an equal sample of telephone numbers, although this can vary based on the sample vendor, number of cases sampled, and amount of additional data appended to each sampled case. Because of the efficiency of the frame (i.e., there are relatively few non-residential addresses), far fewer addresses (than telephone numbers) are required to reach a residential household.

Address-based approaches do, however, have some drawbacks. DSF information cannot be obtained directly from the USPS, but must be purchased through a nonexclusive license agreement with private vendors. The quality and completeness of the address information obtained from these vendors varies widely depending on how often the company updates the listings, the degree to which the listings are augmented with information from other databases, and whether the company purges the records of householders who request that their information not be released (Link et al 2006). The DSF contains post office (PO) box and multi-drop addresses (multiple persons associated with the same address), which may be problematic for in-person and telephone surveys where a street address is required to locate the household or an associated telephone number. Such addresses may be less problematic for surveys which use mail as the recruitment mode (such as with mail or Web surveys). Households with multiple mailing addresses (for example, a street address and a residential PO box) can introduce selection multiplicities if both addresses are utilized.

From an operational perspective, ABS can limit the ability of a research organization to conduct quick turnaround studies. While a majority of the sampled addresses can be matched to a telephone number, the remaining sample must be contacted/recruited first by mail regardless of the actual survey mode used for data collection. This process takes time. As an alternative, an organization could conduct on-going pre-recruitment efforts with these "unmatched" cases (i.e., those with no matched telephone number), obtaining telephone contact information from respondents and providing a ready bank of numbers from which to sample for this portion of addresses. This is, however, a relatively expensive and somewhat complex proposition.

If limited to mail-only, many surveys would also need to be adjusted in terms of length and complexity, as longer, more complex surveys are not readily feasible with a paper-and-pencil approach. Use of a Web survey option and/or a call-in number to a CATI interviewer can alleviate this problem, however, only with households with Web access and very few respondents are likely to call in to complete a survey with the latter design.

As is the case with cell phones, use of address based sampling also requires modification of standard disposition codes (even the American Association for Public Opinion Research's [AAPOR] current disposition list for mail surveys is inadequate as the list only applies to mail surveys where the respondent is known) and a reassessment of response rate calculations as there is currently no agreed upon industry standard for determining the percentage of noncontacted addresses (excluding those for which a post office return was received) to include in the denominator of a response rate.

Conclusions

While it would likely be a mistake to declare that the sun has set completely on landline RDD methodology, it is clear that the approach has serious, seemingly non-recoverable problems in terms of coverage and declining response rates. This is not to say that "telephone surveys" are nearing their end, but rather the reliance on the landline telephone frame as the sole basis for drawing samples for conducting surveys of the general population is in jeopardy. Given the considerable cost of conducting in-person interviews, that mode is likely to remain reserved for only the best funded projects. At the other extreme, use of online surveys based on non-probability, opt-in sample designs is likely to remain a niche, but growing methodology for the foreseeable future. Use of dual frame landline/cell phone studies or address based sample approaches may become more common methodologies in the future. Both have their advantages and disadvantages — some which can be resolved with time and additional research, others which may be intractable.

In the end, the use of a dual-telephone frame approach or an address based approach to sampling comes down to how well each fits the requirements of the research at hand, in terms of cost, quality, and timeliness. What may work well for one research endeavor may not match the needs of another. As a short-term solution, sampling of cell phone exchanges may provide a stop-gap for those conducting smaller to moderate-sized surveys until a more stable, longer-term methodology is refined. An ABS approach is perhaps the most promising foundation upon which such a methodology (or set of methodologies) can be built, providing a stable sampling base, a rich source of characteristic and geographic data for facilitating sophisticated designs, and an opportunity to utilize multiple modes for contacting and conducting surveys with households.

References

Blumberg, S., and J. Luke. 2008. "Wireless Substitution: Early Release of Estimates from the National Health Interview Survey, January-June 2008." Available online at: http://www.cdc.gov/nchs/data/nhis/earlyrelease/wireless200812.htm.

Fahimi, M., D. Kulp, and M. Brick. 2008. "Bias in List-Assisted 100-Series RDD Sampling," *Survey Practice*. Available online at: http://surveypractice.org/2008/09/25/bias-in-list-assisted-100-series-rdd-sampling.

Keeter, S., Dimock M., Kennedy, C., Best, J., and Horrigan, J. (2008). Costs and benefits of full dual frame telephone survey designs. Paper presented at the 63rd Annual Conference of the American Association for Public Opinion Research, New Orleans, LA.

Link, M., Battaglia, M., Frankel, M., Osborne, L., and Mokdad, A. (2007) "Reaching the cell phone generation: Comparison of U.S. cell phone survey results with an ongoing landline telephone survey" *Public Opinion Quarterly* 71:814-839.

Link, M.W., Battaglia, M.P., Frankel, M.R., Osborn, L. and Mokdad., A.H. (2008). Comparison of address based sampling (ABS) versus random-digit dialing (RDD) for general population surveys. *Public Opinion Quarterly*.

Link, M.W., Battaglia, M.P., Frankel, M.R., Osborn, L. and Mokdad., A.H. (2006). Address-based versus random-digit dialed surveys: Comparison of key health and risk indicators. *American Journal of Epidemiology,* 164: 1019-1025.

United States Postal Service. (2005). Delivery Sequence File. Available online at: http://www.usps.com/ncsc/addressservices/addressqualityservices/deliverysequence.htm (accessed July 23, 2007).

Does Continuing Data Collection Beyond One Month Improve the Completion and Response Rates in Behavioral Risk Factor Surveillance System Survey?

Wednesday, February 25, 2009, 7:17:35 AM | Editor

Mohamed G Qayad, Lina Balluz, William Garvin
Centers for Disease Control & Prevention

The behavioral risk factor surveillance system (BRFSS) is an ongoing state-based random-digit-dialing (RDD) landline telephone survey. The data is used for monitoring national, state and local health objectives, and developing local health programs. States are required to call all monthly sampled telephone numbers within a month from their release to survey implementers. When samples are not completed within that month, states strive to complete them shortly thereafter. Despite this endeavor, BRFSS survey response and completion rates have been declining since 2002 (1). Other telephone surveys observed similar trends in response rates (2) (3). Recently, states expressed interest in exploring the effect of continuing the data collection longer than a month on the percentage of completed interviews and response rates.

Included among the factors contributing to this declining trend in the response rates cited by many studies are high refusal rates, increased telemarketing, use of new technologies, increase in single-person households, difficulty in contacting eligible respondents, decline in civic participation, lack of adequate leisure time, increased concern about privacy and confidentiality, demographic shifts in the U.S. population causing high language barriers, and physical and mental inabilities to complete the survey (4) (5). These factors are often grouped into either refusal to cooperate, non-contacts or inability to participate (6).

In 2007, the percentage of completed interviews of the total sample in the BRFSS survey was approximately 10%. Few states maintained or increased their 2006 completion rates (1). States and survey organizations are searching for ways to improve response rates. The impact of various methods on the response rates were examined (7). In BRFSS, the average number of calls per completed interview has increased recently in many states, indicating enhanced efforts to contact selected households. This, however, did not improve the completion or response rates (1). Additionally, retraining interviewers, hiring experienced interviewers and increasing hourly wages become routine practices for survey organizations and states as a potential means to improve response rates. Prolonging the length of time allotted for data collection also resulted in an increase in the response rate (8).

In this paper, we examine whether continuing the data collection beyond one month improves the completion and response rates in BRFSS. If significant gains are observed, loosening the current BRFSS guidelines might become necessary.

Methods

We used the 2007 BRFSS data, a cross-sectional survey conducted in 50 states, Washington DC, and U.S. territories in collaboration with the Centers for Disease Control and Prevention (CDC). A representative sample of household landline telephone numbers is selected using a modified RDD method (9). Within the selected household an adult is selected randomly to be interviewed within 31 days, which is the current practice for data collection. We excluded Michigan and Louisiana from the analysis because of quarterly (3 months) data collection length for Michigan and data collection issues for Louisiana.

For each state, we estimated the percentage of the sample that was called and given a final disposition code (10), percentage of completed interviews and response rates in 31 days, 32 days- 41 days and > 41 days.

The numerator for the percentage of completed interviews was the completed and partially completed interviews (10). For the response rate numerator, we used the completed and partially completed interviews, and records indicating termination of interview in which at least 50% of the core questions prior to demographics section were answered. Because some states did not call all telephone numbers in the sample and could not have interview dates, we used a single denominator, as defined by American Association of Public Opinion Research (AAPOR) (10), to calculate response rates for 31 days, 41 days, and > 41 days. We chose the single denominator because we were interested in the increase in the response rates as a result of the prolongation of the length of the data collection. We used SAS (11) to calculate our estimates.

Results

In 2007, excluding Michigan and Louisiana, a total of 4,184,515 telephone numbers were selected from the U.S. landline telephones for the BRFSS survey. We excluded 344 records with missing disposition codes and analyzed 4,184,171. Of these, 416,723 (10%) interviews were completed; 167,252 (4%) terminated or refused; 106,878 (2.6%) were eligible respondents not interviewed; 415,876 (9.9%) were households where the presence of eligible respondents could not be determined; 611,732 (14.6%) were numbers that could not be determined whether they belong to households or not; and 2,465,710 (58.9%) were ineligible numbers (Figure 1).

Of the total telephone numbers analyzed, 4,173,620 (99.7%) received a final disposition code in 2007. Of these, 3,184,631 (76%) were called and had valid information on the interview date and 988,989 (24%) were not called. Of the numbers called, 2,828,171 (89%) received final disposition code within 31 days, 258,041 (8%) between 32 days to 41 days, and 98,419 (3%) more than 41 days. The percentage of telephone numbers receiving final disposition varied by state (Table 1).

Of the 3,184,631 numbers called in 2007, 415,371 (13%) completed the interviews, of which 94.6% were completed within 31 days, 3.7% were completed between 32 days to 41 days and 1.7 % completed after 41 days. The percentage of interviews completed in these three time intervals varied between states (Table 2). The median increase in the percentage of completed interviews was 3.4%.

The CSARO response rates by state and length of data collection are shown in Table 3. The median CASRO response rate in 2007 for the US was 51%. It increased 1.4% after continuing data collection longer than 31 days.

Discussion

Continuing the data collection beyond 1 month shows a minimal contribution to the percentage of completed interviews and CASRO response rates, but the contribution is slightly higher on the percentage of the sampled telephone numbers that were given final dispositions than both of the former estimates. The median increase in the percent of completed interviews and the percentage of the sample that was given final disposition codes are 3.4% and 6%, respectively. Similarly, the median increase in the response rate is 1.4%. As the response rate and percent of completed interviews indicate, two essential measures of survey success, these gains could not warrant a change in the current guidelines, which is to complete the samples within a month. Improving the efficiency of the survey operation could result in similar gains within the limits of 1 month duration of data collection. Some states completed their samples within a month, and those adopted 3 months (quarterly) data collection length were not different than those following the current 1 month practice in the percent of completed interviews. Also, states that gave final disposition to their samples within a month include those that used large and small samples in their BRFSS survey, and did not confine themselves to call telephone numbers prescreened as working numbers and are likely households.

Furthermore, changing the current guidelines might compromise standardized practices, a major strength for the BRFSS data collection, which allowed survey analysts to compare parameters across states and territories. It could also bring unnecessary disruptions and confusion in survey operations and efficiency in the course of its implementation and introduce additional variation to estimates.

Although the majority of states continue to collect data after 31 days, the remaining numbers in their samples are completed shortly after 31 days, thus preserving comparability of information by time reasonably across states and counties. Seventy three percent of the sample called after 31 days received final disposition within 10 days from the 31 days. Similarly, 80% of the interviews completed after 31 days were completed within 10 days from the 31 days. Studies that examined the effects of the extended length of data collection on response rates showed varied effects (12) and (13), which is consistent closely with our findings across states.

The observed minimal increase in the percent of completed interviews and CASRO response rate from the extended field period might not bias U.S. estimates in diseases, risk factors and disease-risk associations because the majority of completed interviews (95%) were captured within 31 days. Few states could experience biases in state and local estimates because of the wide variations in the proportion of completed interviews captured after 31 days. However, further studies are needed to verify the existence and determine the extent of such bias. Likewise, further studies are needed to examine the differences between the information captured before and after 31 days of data collection.

Our study has limitations. The analysis excluded two states and telephone numbers that were not called. We did not group the states by the organization or agency that collects the data, which could vary in their survey operation strategies. Therefore, generalization of the findings should consider these limitations. In addition, the BRFSS survey uses RDD landlines, and findings might not be applicable to surveys using other modes of data collection.

After 31 days of calling, telephone numbers that were hard to reach are the ones to be called further and are less likely to end up in completed interviews as the results show. Thus, continuing the data collection longer than 31 days is inefficient for landline telephone surveys. BRFSS survey shares similar problems with other landline surveys. Incorporating other modes of data collection, such as cell-phone and mail modes, to RDD landline could bring some solution to the declining response rate problem.

CDC disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily reflect the official position of the Centers for Disease Control and Prevention.

References

- 1. Centers for Disease Control and Prevention. Behavioral Risk Factor Surveillance System (2002-2007). Available at: http://www.cdc.gov/brfss/technical_infodata/quality.htm. Accessed in Aug, 2008.
- 2. Groves RM, Dillman DA, Eltinge JL, Little RJA, eds. 2002. Survey Nonresponse. New York: Wiley.
- 3. Battaliglia JM, Khare M, Martin F, Mary CM, Paul B and Saralyn (2007). “Response Rates: How have they changed and where are they headed?” In advances in telephone survey methodology eds. James M. Lepkowski, Clyde Tucker, J. Michael Brick, Edith de leeuw, Lilli Japel, Paul J. Lavrakas, Michael W. Link and Roberta L. Sangster. New York: Wiley.
- 4. Groves RM, Singer E, Corning A (2000). Leverage-Salience theory of survey participations: Descriptions and an illustration. Public Opin Q. 64: 299-308.
- 5. Tourangeau R (2004). Survey research and societal change. Annu. Rev. Psychol. 55:775-801.

- 6. Groves RM and Couper MP (1998). Nonresponse in household surveys. New York, Wiley.
- 7. Kropf ME, and Blair J. Eliciting survey cooperation: incentives, self-interest, and norms of cooperation. Eval Review 2005: 29 (6); 559-575.
- 8. Keeter S, Miller C, Kohut A, Groves RM and Presser S (2000). Consequence of reducing non-response in a national telephone survey. Public Opin Q. 64:125-148.
- 9. Centers for Disease Control and Prevention. BRFSS operational and user's guide - version 3 (2006). At http://www.cdc.gov/brfss. Accessed in 8/2008.
- 10. American Association of Public Opinion Research (2008). Standard definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. Available at: http://www.aapor.org/uploads/Standard_Definitions_07_08_Final.pdf.
- 11. SAS 9.1. SAS Institute Inc. Cary, NC, USA. 1999.
- 12. Groves RM and Lyberg LE. An overview of non-response issues in telephone surveys. In telephone survey methodology, R. M. Groves et al., editors, John Wiley and Sons, New York, NY, 1988, pp:192-211.
- 13. Collins M, Sykes W, Wilson P and Blackshaw N. Nonresponse: The UK experience. In telephone survey methodlogy, R. M. Groves et al., editors, John Wiley and Sons, New York, NY, 1988, pp:247-256.

The Costs of Using Pre-Paid Incentives in a Physician Survey

Wednesday, February 25, 2009, 7:15:56 AM | Editor

Sean O. Hogan
RTI International

The use of pre-paid monetary incentives in surveys of respondents with specialized knowledge, such as business executives and physicians, has been shown to help reduce overall survey administration costs. Current research suggests that by offering a cash incentive to respondents at the outset of data collection, survey managers may reduce the need for follow-up efforts. This paper uses the results of a survey of office-based physicians in the United States to put a finer point to another, perhaps overlooked component of this "cost saving." Respondents and non-respondents alike often choose not to cash the checks. Almost all sample members who decline to complete a survey forego cashing the incentive check. About 1/3 of the physicians who responded, also did not cash their checks.

This paper addresses two questions. The first question is: to what extent are pre-paid cash incentives misdirected to sample members who cash the check, but do not respond to the survey? A secondary question is: which physician specialties accept pre-paid monetary incentive? The answers to these questions have practical value. Survey managers need to anticipate the extent to which their funds (pre-paid incentives) will be misdirected to non-cooperating or ineligible sample members. Similarly, having a foundation on which to anticipate this risk can inform the proposed price of service to clients. Since this project sampled a variety of medical specialties, the results allow one to identify anticipate need for funds with some granularity, in that the results allow us to identify which medical specialties were most inclined to cash checks.

Background

Research has explored both the practical implications of using incentives as it relates to response rates (Armstrong, 1975; James and Bolstein 1992; and Singer et al. 1999) and the promptness with which physician-respondents complete a survey (Berry and Kanouse 1987). Jobber, Saunders and Mitchell (2004) and Kellerman and Herold (2001) suggest that incremental increases in incentives improve responsiveness to surveys among specialized populations such as physicians and business executives. Gunn and Rhodes (1981) experimented with $0, $25 and $50 incentives and found that the level of responsiveness increased with the value of the payments. Similarly Mizes et al. tested $0, $1 and $5 gifts on a survey of 200 physicians (1984). They too concluded that the responsiveness increased with the value of incentives. In other words, incentives represent reciprocity between researchers and subjects (Gendall et al. 1998).

This increase in responsiveness comes with negligible effect on data quality (for example Mizes et al., Cantor et al. 1997; Cycyota and Harrison 2002; Tambor et al. 1993; DeNelvo et al. 2004, and Doody et al. 2003).

Cash incentives are therefore easily justified as they not only improve response rates, but experimental research indicates they have negligible effects on data quality. Of significance, pre-payed incentives help reduce overall administration costs by reducing the need for mail and telephone follow-up contact (Berry and Kanouse 1987).

Methods

Sampling*:* A stratified random sample of 1728 office-based physicians from all 50 of the United States was selected for this study. Physicians were stratified by specialty, urban and non-urban practice setting and Census region. The sampled medical specialties included family and general practice, internal medicine, and cardiology. We began with equal numbers (576) of each specialty. Urbanicity was defined by whether the sampled physician's office ZIP code is in a metropolitan statistical area or non-metropolitan statistical area. The Census regions are Northeast, Midwest, South and West. The SK & A Information Office Based Physician file was used to draw the sample. The SK & A file is a national profile of office-based physicians in the United States.

Data collection*:* Data for this study were collected by RTI International on behalf of the Centers for Medicare and Medicaid Services (CMS), a division of the U.S. Department of Health and Human Services. Data were acquired through the web survey, by mail, over the telephone and by fax. Study procedures included a five-wave mailing, telephone prompting and an out-bound facsimile. All mailings used CMS stationery and bore the signature of the agency's chief medical officer. The first wave mailing was sent at the end of the first week of January 2006. It informed the respondent of the sponsorship and purpose of the study; it mentioned that the study had been endorsed by three medical societies (American Academy of Family Physicians, the American College of Cardiology or the American College of Physicians); it mentioned that an incentive would be offered and assured the respondent of confidentiality.

The second mailing was sent three business days later, with the 8-page survey, supporting materials, a $25 check and reply envelope. These same materials were sent again to non-respondents at the sixth, tenth and twelfth weeks of data collection. A reminder post card was sent during the third week of data collection. Prompting calls were made during the fourth through fifth weeks.

Results

A total of 1027 complete surveys were returned. After eliminating 111 dead and ineligible cases (6.4%) the survey resulted in an overall response rate of 63.5% of the eligible sample. Family physicians were most cooperative, with 69% responding. Internists were next, with 65% and cardiologists were least cooperative, with a response rate of 54%. We received 29 cases with tracking numbers removed and they are not analyzed.

A total 752 (43.5%) of all 1728 incentives checks were cashed. Table 1 indicates that 90% of those who cashed a check also cooperated in the survey. Slightly more than 8% of the checks cashed were cashed by non-respondents and 2% of the checks cashed were cashed on behalf of ineligible respondents. Of those who did not cash a check, three-fifths (62%) did not respond to the survey. Interestingly, a large minority (35%) of those who did not cash a check did participate in the survey.

Table 1: Check cashing activity by survey participation

Sample members	Responded	Non-respondent	Refused	Ineligible
Cashed(% of all those cashing)	673 (89.5%)	62 (8.2%)	1 (0.1%)	16 (2.1%)
Did not cash(% of all those not cashing)	344 (35.2%)	520 (53.3%)	17 (1.7%)	95 (9.7%)

Pearson chi-squared test for significance = 0.000.

Table 2 summarizes check cashing activity by medical specialty among eligible sample members who completed the survey. Family practitioners (71%) and internists (71%) cashed checks in nearly equal proportions. Meanwhile, a lower proportion of cooperative cardiologists (57%) cashed their checks.

Table 2: Check cashing activity among respondents by medical specialty

Specialty	Cashed	Not cashed
Family practitioners	262 (71.4%)	105 (28.6)
Internists	246 (70.9%)	101 (29.1)
Cardiologists	161 (56.7%)	123 (43.3%)

Pearson chi-squared test for significance = 0.000.

Among the eligible non-respondents, 10% of the non-responding cardiologists cashed a check; 8% of non-responding internists cashed the stipend and 9% of non-responding family practitioners accepted the honoraria. One may surmise that in some cases, office staff deposited the check with other bank transactions without consulting the sampled physician.

Discussion

Prior research has demonstrated that pre-paid incentives help control survey administration costs by reducing follow-up effort needed to reach satisfactory response levels. It is generally assumed that exchange theory explains this (see Gunn and Rhodes). This paper challenges that assumption, since no “exchange” is finalized when a majority of respondents decline to accept the payment. Perhaps physician-respondents are moved by what the incentive symbolizes: the importance of the survey data to the researcher (Berry and Kanouse). Perhaps incentives represent only one of several cues that symbolize a survey's importance (Heberlein and Baumgartner, 1978). Whatever the reason, experimental research shows that the presence of pre-paid incentives brings about their desired effect.

Virtually all (90%) of the cashed checks were cashed by physicians who also responded to the survey. Check cashing activity among cooperating physicians varied by medical specialty. Only 10% of the checks that were cashed were cashed by ineligible or non-responding sample members. Physicians who do not respond to surveys tend not to cash the pre-paid checks, meaning a small proportion of a survey project's budget is misdirected in this way.

For this project, advance payment of cash incentives placed a total of 4.6% of the incentive budget in the hands of non-participating physicians. This risk can be balanced against the checks of responding physicians who did not cash the checks. In our case, the value of un-cashed checks from eligible respondents equaled $8,600, well above the $1,975 paid out to ineligible cases and non-respondents.

Berry and Kanouse (1987) indicate that survey administration costs are lower when incentives are used, because less follow-up contact is needed to acquire sufficient response rates. Coupled with this study, one may infer that survey managers can realize additional cost benefits by employing pre-paid cash incentives in a survey of physicians. Given that only a fraction of responding physicians cashed their checks, exchange theory is only a partial explanation of the motivating influence of pre-paid incentives.

References:

Armstrong, JS (1975) "Monetary Incentives in Mail Surveys," *Public Opinion Quarterly*, 39:111-16.

Berry, SH and Kanouse, DE (1987) "Physician Response to a Mailed Survey," *Public Opinion Quarterly*, 51:102-14.

Cantor, D., Allen B., Cunningham, P., Brick, JM, Slobasky, R., Giambo, P and Kenny, G. "Promised (1997) Incentives on a Random Digit Dial Survey," appearing in *Non-Response in Survey Research, Proceedings of the Eighth International Workshop on Household Survey Non-Response,"* Koch, A and Porst, R (eds) ZUMA, Mannheim, Germany.

Cycyota, CS and Harrison, DA (2002) "Enhancing Survey Response Rates at the Executive Level: Are Employee- or Consumer-Level Techniques Effective?" *Journal of Management,* 28(2) 151-176.

DeNelvo, CD, Abatemarco, DJ., and Steinberg, MD (2004). "Physician Response Rates to a Mail Survey by Specialty and Timing of Incentive," *American Journal of Preventative Medicine,* 26(3):234-236.

Doody, MM, Sigurdson, AS. Kampa, D, Chimes, K, Alexander, BH, Ron, E, Tarone, RE and Linet, MS (2003) "Randomized Trial of Financial Incentives and Delivery Methods for Improving Response to a Mailed Questionnaire," *American Journal of Epidemiology,*157: 643-651

Heberlein, TA and Baumgartner, R (1978). "Factors Affecting Response Rates to Mailed Questionnaires: A

Quantitative Review of the Published Literature." *American Sociological Review* 43: 447-62.

Gendall, P., Hoek, J., and Brennan, M. 1998. "The Tea Bag Experiment: More Evidence on Incentives in Mail Surveys," *Journal of the Market Research Society*, 40(4): 347-351.

Gunn, WJ and Rhodes, IN (1981) "Physician Response Rates to a Telephone Survey: Effects of Monetary Incentive Level," *Public Opinion Quarterly*, 45:109-15.

James, JM and Bolstein, R (1992) "Large Monetary Incentives and Their Effect on Mail Survey Response Rates," *Public Opinion Quarterly*, 56: 442-453.

Jobber, D, Saunders, J, and Mitchell, VW (2004) "Prepaid Monetary Incentive Effects on Mail Survey Response, *Journal of Business Research* 57 (2004) 347-350.

Kulka, RA (1999) "Providing Respondent Incentives in Federal Statistical Surveys: The Advance of the Real 'Phantom Menace'?" presented to the Washington Statistical Society, June 10, 1999.

Mizes, SJ, Fleese, EL, and Roos, C (1984) "Incentives for Increasing Return Rates: Magnitude Levels, Response Bias and Format," *Public Opinion Quarterly*, 48:794-800.

Sheatsley, PB and Loft, JD (1981) "On Monetary Incentives to Respondents," *Public Opinion Quarterly*, 45:571-72.

Singer, E, Groves RM, and Corning, AD, (1999) "Differential Incentives: Beliefs about Practices, Perceptions of Equity, and Effects on Survey Participation," *Public Opinion Quarterly*, 63:251-60.

Tambor, ES, Chase, GA, Faden, RR, Geller, G, Hofman, KJ, and Holtzman, NA (1993). "Improving Response Rates through Incentive and Follow-Up," *American Journal of Public Health*, 83:11, 1599-1603.