

## Call Efforts and Subject Matter Estimates: the Experience with a Health Related RDD Survey

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Telephone surveys with “low” response rates often generate concern about the representativeness of the sample and the accuracy of estimates derived from collected data, i.e., nonresponse biases in subject matter estimates attributable to unsuccessful attempts to obtain information from eligible respondents (“non-response biases”).

Non-response bias is a data quality issue that has attracted a lot of attention. This is especially the case with respect to telephone surveys as the response rates of these surveys have declined precipitously in recent years (Curtin, Presser, and Singer 2003; Groves and Couper, 1998; Keeter et al. 2000). It was found in the University of Michigan’s Survey of Consumer Attitudes that the 2002 response rate was six percentage points below the expected level based on the 1979-1996 trend (Curtin, Presser, and Singer 2003). A trade organization estimate suggests that the current industry average response rate for non-governmental Random-Digit-Dialing (RDD) telephone surveys is a low-teen figure (CMOR 2003). The low rates are related to the proliferation of fax machines, answering machines, blocking devices and other telecommunications technology that make it more difficult to reach, identify and interview eligible respondents. The low rates are also associated with the amount of telemarketing, political polling, fund raising, and market research that is now done via telephone calls. Furthermore, there appears to be an upward trend in refusal rates (Curtin, Presser, and Singer 2003) and more and more eligible households refuse to participate in any telephone surveys (Tuckel and O’Neill 2001).

Despite the concern that “low” response rates may produce less representative samples, several recent studies have failed to show significant discrepancies of estimated statistics in surveys with 40 – 70 percent response rates. In an experimental study of two telephone surveys with 36 percent and 61 percent response rates, respectively, only about 10 percent of 68 subject matter results were significantly different; in addition, there were few areas where

there was a systematic contrast between the two samples (Keeter et al. 2000).<sup>1</sup> A recent replication of Keeter et al. (2000) again found that there were relatively small differences in 90 topics between two telephone surveys with 27 percent and 51 percent response rates, respectively (Pew, 2004). Yet, the study also reported notable differences between hardest-to-reach respondents and other respondents, the former defined as those who had refused the interview at least twice before complying, or required 21 or more calls to complete the interview, or both (Pew, 2004). On the other hand, Groeneman and Tobin (2002) reported that only 10 percent of the core responses were found to be statistically different by the number of calls needed to complete an interview (1, 2-3, 4-6, and 7+ calls). Curtin et al. (2000) found that differences in the Index of Consumer Sentiment between easier and harder-to-reach respondents are associated, but weakly, with the number of calls to complete an interview but are not with whether a respondent needed to be converted from refusal. And, this finding was obtained after controlling for respondents’ demographic characteristics.

The present study extends the existing literature in two aspects. First, this study applied a statistical technique, regression analysis, which can help isolate the relationship of call efforts (number of calls and refusal conversion) and subject matter estimates. Second, this study examined consumer responses to nutrition and health topics and thus explored how much the existing findings apply to different subject matters. The findings of this study should enrich researchers’ understanding of telephone non-response biases.

Chi-square tests and t-tests have been used in most of the existing research, e.g., Fuse and Outwater (2003), Groeneman and Tobin (2002), and Keeter et al. (2000), to compare responses by easier-to-reach and by harder-to-reach respondents. Unfortunately, these statistical techniques may yield limited information about the relationships between call efforts and subject matter responses. The tests investigate independence of responses, percentages or means, from respondent classification by how much effort was used to complete an interview. As such, the tests focus on bivariate relationships

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<sup>1</sup> The main differences between the two surveys are: (1) the “standard” survey lasted for 5 days while the “rigorous” survey lasted 8 weeks, and (2) advance letters with a \$2 incentive were used in recruiting respondents for the “rigorous” survey.

between one and only one factor, call effort, and responses. If and when responses to a question are also related to factors other than call effort, then an alternative statistical technique, such as regression, is more useful than Chi-square tests or t-tests in teasing out how each individual factor, including call effort, is associated with responses. Indeed, the regression technique has been applied in Curtin et al. (2000), in which the association between the Index of Consumer Sentiment and refusal and number of calls was examined by controlling for demographic variables. Nevertheless, it is not clear whether the survey used in Curtin et al. (2000) contains other questions that may also have a relationship with the Index and how the inclusion of such questions may have affected their findings. In this study, I took advantage of the availability of a large set of subject matters, in the same telephone survey, that conceptually are inter-related and should be controlled for when examining call effort-response relationships.

The existing literature has covered subject matters ranging from Consumer Sentiment Index (Curtin et al. 2000), ethnicity and religion affiliations and practices (Groeneman and Tobin, 2002), to political and social opinions (Fuse and Outwater, 2003; Keeter et al., 1999; Pew, 2004). Limited coverage on health topics can be found in Dennis et al. (1999) about children immunization and in Pew (2004) about lifestyle behaviors such as exercise and smoking. To the extent that public and private sectors often collect health-related information from the public using telephone surveys, there is a need for survey researchers in health-related areas to also be aware of the relationships between call efforts and survey responses. This study contributes to the knowledge base by examining a wide range of subject matters on consumers' reported knowledge, attitudes, and practices related to health and nutrition.

### *Data and Methodology*

The material of this study came from the 2002 FDA Health and Diet Survey (HDS), sponsored by the FDA's Center for Food Safety and Applied Nutrition (CFSAN). The purpose of the survey is to identify and to track national distributions of consumer knowledge, attitudes, and practices related to nutrition, health, foods, dietary supplements, and other regulated products and information.

The 2002 HDS is a random-digit-dialing (RDD) telephone survey. The universe of the population was English-speaking non-institutionalized adult (18y +) residents in the 50

states and the District of Columbia. Households were randomly selected from national representative single-stage samples of telephone numbers generated from the GENESYS system. One adult per household was interviewed. In multiple-adult households, the eligible respondent was selected using the most-recent-birthday method. Participation was voluntary and not compensated. Interviews were conducted from May 14 to September 24, 2002 by a contractor using the Computer-Assisted-Telephone-Interview (CATI) technique and an FDA-developed questionnaire. The survey interviewed 2,743 respondents and achieved a response rate of 41 percent, per AAPOR Response Rate 5.<sup>2</sup> The response rate would have been lower had we not taken measures to maximize the response rate, including (1) making as many call attempts as needed, up to 41 call attempts, to complete an interview, and (2) making conversion calls, by specially-trained and selected conversion specialists, to initial refusals about four weeks following the initial contact.

The study was designed to answer the question of whether there are systematic relationships between subject matter estimates and, respectively, those who responded without and with refusal conversion effort, and those who responded "earlier," i.e., needed fewer call attempts to complete an interview, and who responded "later," i.e., needed more call attempts to complete an interview.

A total of 100 question items were examined in this study. They include 64 items with binominal response measures (e.g., yes/no, correct/incorrect) and 36 items with rank-order response measures (e.g., a lot/a little/none information, strongly agree/somewhat agree/somewhat disagree/strongly disagree). Contents of the subject matters include 35 knowledge items (e.g., awareness of diet-health relationship, awareness of which foods have saturated fats), 49 behavior items (e.g., use of dietary supplement labels to find information, frequency of using food labels at first purchase), and 16 attitude items (e.g., views of one's own blood cholesterol level, degree of usefulness of dietary supplement labels).

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<sup>2</sup> Response rate = completes / (completes + quits + refusals + callbacks to complete + screener completed but not available), where the AAPOR disposition codes are 1.1 for completes, 2.12 for quits, 2.11 for refusals, 2.35 for callbacks to complete, and 2.21 screener completed but not available (AAPOR, 2004).

Logistic and ordered logistic regressions were used to investigate the relationships between call efforts and subject matter responses. Call efforts were measured by two variables. One is a dichotomous variable of conversion status. The other measures the number of call attempts until an interview was completed. The model controls for other potentially relevant independent variables as well as demographic characteristics.

Each question item was examined three times, each time with a different measure of call attempts (1-6 times vs. > 6 times, 1-8 times vs. > 8 times, or number of calls). Thus, a total of 192 (3 x 64) logistic regressions were performed for the 64 question items with a binomial response measure, and a total of 108 (3 x 36) ordered logit regressions were performed for the 36 questions with a rank-order response measure, respectively.

### **Results**

Among question items with a binominal response measure, conversion effort was significantly related to response distribution in 10 of 192 (5%) regressions. Four of them were found in knowledge. The other six were found in behavior questions. Only a few significant relationships were found between the number of calls and question items with a binominal response measure.

As for question items with a rank-order response measure, significant relationships between conversion and responses showed up in 17 of the 108 regressions (16 %). Eleven were found in behavior questions. The other six differences were found in *attitude* questions.

### **Conclusion**

Using the 2002 FDA Health and Diet Survey as a case study, I found that relatively few subject matter estimates have statistically significant relationships with measures of call effort used to maximize response rate, either refusal conversion or number of calls. In addition, the study appears to suggest these findings are fairly robust with respect to the measure of call effort, especially number of call attempts. Nonetheless, conversion refusal appears to be related to response variations more often than number of calls.

The findings in this study are qualitatively similar to that of most of the existing research. Yet, the use of regression techniques may provide stronger evidence of the relationships between call efforts and subject matter estimates. In addition, the study has

expanded the focus of the literature beyond social and political topics so researchers can begin to have some better knowledge of how call efforts and consumer responses to health and nutrition issues may be related.

Having said that, however, more research would be needed to see if the findings of this and other studies can be extended reliably across topic areas, response measures, and time periods. Also, because refusal conversion and number of calls seem to have differential relationship with subject matter estimates, it would be useful to find out why, how, and when such differences may occur.

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