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Certified Versus First-Class Mail in a Mixed-Mode Survey of Next-of-Kin Respondents

Gail S. Poe[1], *Isadore Seeman*[2], *Joseph K. McLaughlin*[3], *Eric S. Mehl*[4], *and Michael S. Dietz*[5]

Abstract: Results are presented of an experiment designed to investigate the effects of certified and first-class mail on final response and refusal rates in a mixed-mode survey of next-of-kin respondents. The use of certified mail did produce an initial higher response rate, although after followup with telephone and in-person interviews the final response rate was not higher for the certified mail group. Moreover, refusal rates were significantly higher for the group sent certified mail. The use of certified mail did, however, lower overall survey costs.

Key words: Mail survey; mixed-mode survey; next-of-kin respondents.

1. Introduction

Mixed-mode surveys are becoming increasingly common. They have the advantages of higher response rates than mail surveys alone and lower costs than telephone or personal visit surveys alone. Four National Mortality Followback Surveys were conducted between 1961 and 1968 using mail followed by personal visits and telephone calls and the final response rates ranged between 91% and 95% (cf. Poe 1984). Hence, in planning for the 1986 National Mortality Followback Survey (NMFS), conducted by the National Center for Health Statistics (NCHS), it was decided to use a mixed-mode strategy.

A theoretical framework for mail and telephone surveys called the Total Design Method (TDM) is given by Dillman (1978). In the absence of a fully developed theoretical framework for mixed-mode surveys, the TDM approach was considered for the mail portion of the 1986 NMFS. Important features of the TDM are a personalized cover letter, a simple and attractive questionnaire, and a followup mailing. One week after the initial mailing, the entire sample (respondents and nonrespondents) receives a postcard serving as a "thank you" or reminder. Three weeks after the initial mailing all non-respondents receive a new questionnaire and a cover letter. Seven weeks after the initial mailing this procedure is repeated, but this time the questionnaire is sent by certified mail.

It was decided not to personalize the

[1] Former Survey Statistician, National Mortality Followback Survey, National Center for Health Statistics, Hyattsville, MD 20782, U.S.A.
[2] Former Project Director, National Mortality Followback Survey, National Center for Health Statistics. Hyattsville, MD 20782, U.S.A.
[3] Epidemiologist, Biostatistics Branch, Division of Cancer Etiology, National Cancer Institute, Bethesda, MD 20892, U.S.A.
[4] Lead Systems Analyst, Westat Research, Inc., Rockville, MD 20850, U.S.A.
[5] Systems Analyst, Westat Research, Inc., Rockville, MD 20850, U.S.A.

cover letters in the 1986 NMFS because of the large sample size (n = 18,733). However, consistent with Dillman's strategy, attempts were made to make the questionnaire simple and attractive, and a follow-up "thank you" or reminder was sent to all respondents.

Although the use of certified mail has been shown to achieve higher response rates in mail surveys (e.g., DeLeeuw and Hox 1988; Dillman, Christenson, Carpenter, and Brooks 1974; House, Gerber, and McMichael 1977; Tedin and Hofstetter 1982; and Sirken, Pifer, and Brown 1960), the effects of certified mail on final response rates in mixed-mode surveys where telephone or personal interviews are used to followup on nonrespondents were not known. Although certified mail has been used to convey importance and urgency to the respondents (Dillman 1978), it was conjectured that the use of certified mail in a mixed-mode survey might alienate some potential respondents and cause them to refuse a telephone or personal interview follow-up attempt.

Certified mail provides the sender with a receipt showing that the mail has been received by the addressee. Before the mail carrier can leave the envelope, someone at the delivery address must sign a card. If no one is present when the mail carrier arrives at the delivery address, the addressee must either pick up the mail at the post office or make arrangements to be present the next time that the mail carrier attempts delivery. Certified mail frequently is used because the sender needs legal proof that the addressee has received the particular piece of mail. For example, large insurance checks and legal notices are often sent by certified mail.

This study is a controlled experiment designed to investigate the effects of certified and first-class mail on final response and refusal rates in a mixed-mode survey of next-of-kin respondents. Also analyzed are the cost implications of the type of mail used. Whereas certified mailings are more expensive than first class, if they result in fewer field followups the total survey costs may be lower.

2. Study Design

The experiment was part of a large pretest study conducted by the NCHS in 1985 in preparation for the 1986 NMFS. The details of this pretest have been described in Seeman, Poe, and McLaughlin (1989). The NMFS is a periodic survey conducted by NCHS of the habits and experiences of recently deceased subjects with information provided by the next of kin. For the pretest, a sample of 1,360 death certificates of persons 25 years of age and older was selected from four states: Illinois, Vermont, Virginia, and New Mexico. These states were chosen to provide geographical and racial/ethnic variation. The sampling frame was death certificates from NCHS' Current Mortality Sample (CMS) (NCHS 1984). The CMS is a cooperative program between NCHS and the states to provide timely mortality information on a 10% systematic sample of deaths in the United States. In the pretest, blacks were oversampled at a rate of 1.8 times the rate for persons other than black; and all deaths from ischemic heart disease at age 25–44 were selected. All survey estimates are weighted by applying to each survey observation the inverse of its probability of selection.

The pretest sample was not designed to be a probability sample of all adult deaths in the U.S., as the main survey sample was. However, a comparison of the total pretest sample (weighted to adjust for differential sampling rates) with all deaths in the U.S. for 1984 showed that the deaths in the

Table 1. Demographic characteristics of deceased subjects in pretest sample and all United States deaths, 1984

	Pretest sample Percent	United States deaths Percent
Total	100.0	100.0
Male	50.6	53.0
Female	49.4	47.0
White	84.6	83.9
Male	41.9	43.8
Female	42.8	40.1
Black	14.5	10.5
Male	8.1	5.7
Female	6.4	4.8
Age		
25–34	3.3	2.5
35–44	3.4	3.1
45–54	5.8	5.8
55–64	13.4	14.1
65–74	26.0	23.4
75–84	28.0	27.0
85+	19.9	19.5

sample did not differ substantially from U.S. deaths with regard to sex or most age categories (Table 1). In the sample, the proportion of blacks was 4.0 percentage points higher than in total U.S. deaths which was accounted for by the inclusion of Virginia and Illinois, states which have higher than average black populations.

The major topic areas of the pretest, as well as the main survey, were medical care in the last year of life (such as hospital and nursing home care); health practices (such as tobacco use and diet); socioeconomic status (such as education, income and assets); and reliability of death certificate information. The questionnaire contained over 130 possible response items and it is estimated that it took a minimum of one-half hour to complete. The informant on the death certificate, normally a close relative, was usually the respondent. If the name of an informant was not given on the death certificate, funeral directors, attending physicians, coroners, and others were contacted to obtain the name and address of a close relative or other suitable respondent. The last resort was to address the questionnaire to "next of kin" at the decedent's address listed on the death certificate. The U.S. Bureau of the Census was the data collection agency designated by NCHS for both the pretest and the main survey. The self-administered questionnaire was mailed to informants by first-class government-paid mail about six months after death. A postage-paid return envelope was included. Ten days later a letter was mailed to all original addresses thanking them if they had returned the questionnaire and reminding them to do so if they had not. One month after the initial mailing, a second copy of the questionnaire was mailed to nonrespondents.

The sample for this second questionnaire mailing was randomly split, with half of the nonrespondents receiving a questionnaire by first-class mail, the other half by certified mail. After four more weeks, telephone or personal interviews were initiated for the remaining nonrespondents. Interviewers were assigned without regard to the respondent's first-class or certified mail status. Of those who completed the questionnaire, 35% were spouses; 9%, parents; 31%, sons or daughters; 25%, siblings; and 10%, friends and other relatives.

Because the respondents were usually close relatives of recently deceased persons, it was assumed that answering detailed questions about the decedent's life, illnesses, disability and death would be painful. Thus, if at any time an explicit verbal or written refusal was received, no additional contacts were made. Because death certificates were the sampling frame, the decedent's characteristics of race, sex, and age were the only variables available for all subjects: for those decedents for whom there was a completed questionnaire, as well as for those for whom there was no questionnaire. The only available characteristic for the respondents (next of kin) was their relationship to the decedent. If we received no response to the questionnaire, there was no information on respondent characteristics.

The response rates are defined in this paper as the number of subjects for whom completed questionnaires were obtained divided by the number of subjects for whom attempts were made. Thus response rates to the second mailing were calculated using only those respondents who were sent a second mailing and rates for the field phase were calculated using only as respondents for whom a field contact was attempted. Certain outcomes such as uninformed next of kin and no next of kin were not included in subsequent attempts. Statistical significance was evaluated using a two-tailed t-test (Snedecor and Cochran 1967).

3. Results

At the end of all phases of this mixed-mode survey the final response rates did not differ between the group sent certified mail (84.0%) and the group sent first-class mail (86.5%) (Table 2) (See footnote 6).

In contrast to the final response rates, the pattern of response to the intermediate study phases differed significantly. After the first mailing, which was delivered by first-class mail to all informants, 42.8% responded. Then in the second mailing, among the certified mail sample 38.1% responded, giving a cumulative response rate of 63.6% for the two mailings. Of the certified mail nonrespondents who were then followed up in the field 69.7% responded, yielding the overall final response rate of 84.0%. In contrast, among the first-class mail sample only 25.5% responded to the second mailing, giving a cumulative rate of 56.6% for the two mailings. During the field followup, responses were received from 79.5% of the first-class mail nonrespondents, yielding a final response rate of 86.5%.

[6] Three other experiments were included in the pretest (Seeman, Poe, and McLaughlin 1989). In the first, designed to test the effects of "Don't Know" (DK) boxes, a random half of respondents received a questionnaire with DK boxes and the other half received a questionnaire without DK boxes (Poe, Seeman, McLaughlin, Mehl, and Dietz 1988). In the second experiment a shorter version of the questionnaire was tested to see the effect on response rates, and in the third experiment the nonrespondents to the second mailing were randomly split into two groups with one group contacted first by telephone followed by a personal visit if the telephone contact was unsuccessful, and the second group being contacted first by personal visit followed by a telephone call if the personal visit was unsuccessful. For each of the four experiments included in the pretest, the treatment assignments were randomized across all of the other experimental treatments. There were no interaction effects among the experimental treatments.

Table 2. Response rates by mode of mail

	Certified mail Percent	First-class mail Percent
Final response	84.0	86.5
Response to field followup (telephone/personal visit)	69.7	79.7
Cumulative response after second mailing	63.6	56.6
Response to second mailing	38.1	25.5
Response to first mailing[1]	–	42.8

[1]Only first-class mail was used for the first mailing.

The pattern of response to the second mailing held true for the decedent characteristics of age, race, and sex (Table 3) and was consistent across most decedent characteristics during the field followup (Table 4). When the sample was subdivided by mail type and decedent characteristic groups, the cell sizes were too small to make inferences about differences across decedent characteristic groups.

Table 5 shows the refusal rates for the two mail modes by stage of the study. In the mail stages a written message or phone call from the respondent stating an unwillingness to cooperate constituted a refusal. In the field followup, a refusal was registered when the respondent verbally refused to be interviewed. The final overall refusal rate for the certified mail group was double that of the first-class group (7.2 vs. 3.5%; $P < 0.05$). In the field the phase rate was also twice as high (11.8 vs. 5.4%; $P < 0.05$) and in the second mailing the rate was 4 times as high in the group sent certified mail (4.6 vs. 1.1%; $P < 0.05$). An examination of refusal rates showed no significant differ-

Table 3. Response rates to second mailing by mode of mail according to decedent characteristics

Decedent characteristics	Certified mail Percent	First-class mail Percent
All decedents	38.1	25.5
Age		
Under 55 years	32.0	18.6
55–64 years	38.7	21.3
65–74 years	36.4	24.7
75–84 years	41.5	28.6
85 years or older	38.7	31.4
Race		
Black	35.0	20.5
Nonblack	38.7	26.7
Sex		
Male	42.7	27.0
Female	33.8	24.0

Table 4. Response rates to telephone and personal interviews by mode of mail according to decedent characteristics

Decedent characteristics	Certified mail Percent	First-class mail Percent
All decedents	69.7	79.7
Age		
Under 55 years	71.7	62.6
55–64 years	72.4	82.3
65–74 years	72.0	87.4
75–84 years	60.7	82.2
85 years or older	75.0	83.1
Race		
Black	62.7	81.5
Nonblack	71.2	79.2
Sex		
Male	62.7	79.2
Female	75.3	80.2

ence by decedent's age, sex, or race (data not shown).

4. Discussion

Consistent with previous research, we found that certified mail achieved a higher response rate than first-class mail in the mailing phase of the study. However, when further follow-up was attempted by telephone and in-person interviews the final response rate was slightly higher for those contacted by first-class mail (86.5 vs. 84.0), although not significantly. Thus, in a mixed-mode survey, certified mail does not appear to ensure a higher final response rate.

If information were available in this study on respondent characteristics for the entire sample, including nonrespondents, an analysis would be possible that identified specific socio-economic characteristics of respondents who react "better" to certified mail. Nevertheless, the findings from this study should provide valuable insight for others planning a mixed-mode survey.

Even though in our study certified mail did not ensure a higher overall response rate, and generated more refusals, the use of first-class mail should be weighed against its higher overall survey costs in mixed-mode surveys. For the certified mail sample, telephone or personal interviews were necessary for 29.3% compared with 37.5% for first-class mail sample. Since telephone calls and

Table 5. Refusal rates by mode of mail (percent)

Mode	*First mailing*[1]	*Second mailing*	*Field interviews*	*Final*
Certified mail	–	*4.6*	*11.8*	*7.2*
First-class mail	*0.8*	*1.1*	*5.4*	*3.5*

[1]*Only first-class mail was used for the first mailing.*

personal visits are substantially more expensive than certified mailings (certified letters cost approximately $1 each), the use of first-class mail would represent a nontrivial increase in cost.

Assuming an average per interview cost of U.S. $70 for telephone or personal visit, the increased cost for a survey of 1,000 respondents would be U.S. $5,740 and for a survey of 20,000 would be U.S. $114,800. Dependent on other survey costs, this increase may or may not compose a large percentage of total survey costs. Clearly, in a mixed-mode survey certified mail has the potential to lower overall survey costs.

The increased refusal rate in the certified mail group may be cause for concern. Although we have no direct evidence, it is possible that the respondents who refused may have been more annoyed or frightened by certified mail than first-class mail, particularly if they were not initially at home and went to the post office to pick up the questionnaire. The annoyance factor, which may be of particular concern in certain types of investigations, has been documented in earlier studies such as Slocum, Empey, and Swanson (1956).

Because of the uniqueness of our respondent population (relatives of recently deceased individuals) it would be worthwhile to repeat this experiment using other populations. It would also be useful in future studies to collect information on respondent characteristics and on reasons for respondent refusals. Furthermore, other experimental variations such as a third questionnaire mailing prior to field follow-up may be worthy of investigation.

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