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Brief Report

Conducting Physician Mail Surveys on a Limited Budget

A Randomized Trial Comparing $2 Bill Versus $5 Bill Incentives

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OBJECTIVES. The effects of incentive size on physicians' response rates to a mail survey were determined.

METHODS. One thousand US primary care physicians were assigned randomly to receive a survey with either a $5 bill or a $2 bill as an incentive. For each of the two incentive groups, the overall response rate for three mailing waves, the total cost, and the total cost per usable response were measured.

RESULTS. The response rate among those receiving the $5 bill (61%) was 32% higher than the response rate among those receiving the $2 bill (46%); overall costs were slightly higher in the $5 group, but the cost per response for each group was similar ($15.46 versus $14.93). For the same cost, a higher response rate could have been achieved in the $2 group if costs saved from foregoing the third mailing were instead used to increase the incentive for a portion of the subjects.

CONCLUSIONS. A $5 bill incentive yielded a higher response rate among the physicians in this study than did a $2 bill incentive. Moreover, the powerful effect of the incentive size, combined with the consequent decline in the costs of subsequent mailing waves, suggests that resources in a fixed survey budget are allocated more efficiently to increasing the initial incentive rather than to providing a third wave to nonresponders.

Key words: cost effectiveness; data collection; epidemiology; financial incentives. (Med Care 1998;36:95–99)

Response rates among mail surveys of physicians generally have been lower than response rates for other subjects.[1] A variety of techniques have been suggested to increase response rates, including providing monetary incentives—either by cash or check, and either in advance or on completion—altering the style of envelope or postage, using mail or telephone reminders, and similar techniques.[2–6] Many of these have been demonstrated to increase response rates in physician and nonphysician surveys, but often at significantly increased investigator cost.

In general, larger financial incentives are more effective than smaller ones.[7] Nevertheless, some believe that monetary incentives are effective not so much because they compensate respondents,

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but because providing an incentive (particularly in advance) induces sentiments of reciprocity among potential respondents.[8] Indeed, the few dollars often included with mailed questionnaires could never compensate physicians at market rates for the several minutes they might devote to completing an instrument. A $1 bill received with an instrument, however, can present a problem to potential nonresponders. Subjects may feel guilty about taking the dollar and not completing the instrument. Further, one cannot simply discard the dollar, although some nonresponders will return the incentive in the envelope designed for the completed instrument. Larger incentives might induce more guilt.

We decided to evaluate the effect of incentive size by randomly assigning physician subjects to receive either a $5 bill or a $2 bill along with their survey materials. We also wondered whether the relative novelty of a $2 bill might offset the known advantages of larger financial incentives.

Methods

The target subjects were 1,000 primary care physicians identified through the American Medical Association Physician Master File. These subjects were assigned randomly to either the $2 incentive group or the $5 incentive group.

Each subject received one of two versions of a four-page survey instrument designed to assess attitudes about cost containment in cancer screening. Survey versions were balanced within incentive group. The two versions of the instrument were identical except that one version presented slightly more cost information, as described elsewhere.[9] Each packet contained a preaddressed, stamped return envelope and a cover letter signed by two investigators. Instruments were coded to identify respondents, and each subject received up to three mailings of the complete packet at 3-week intervals. The first mailing contained either a $5 bill or a $2 bill. No incentives were included in subsequent mailings.

Cost estimates used in the analysis are seen from the perspective of the investigator and are reported in Table 1. Handling costs were calculated by distributing the hourly wage rate, including benefits, of the research assistant for the time allocated to mail survey activities.

TABLE 1. Cost Estimates for Each Packet (Not Including Financial Incentives)

Item	Per Item Cost to Investigator ($)
Survey instrument	0.12
Cover letter	0.09
Outgoing envelope	0.12
Outgoing postage	0.55
Return envelope	0.12
Return postage	0.55
General handling	0.50
Total cost per packet	2.05

Results

Of the 500 instruments distributed to the $2 group, 18 were returned by the post office as undeliverable and 221 were returned completed by subjects for a response rate of 45.9% (95% confidence interval: 40.6%–51.0%). Of the 500 instruments distributed to the $5 group, 16 were returned as undeliverable and 296 were returned by subjects for a response rate of 61.2% (95% confidence interval: 55.9%–66.1%). The difference in response rates was significant ($P < 0.001$).

Respondents from the two groups did not differ in age, gender, years in practice, practice type or setting, or in any other measured characteristic. Similarly, responses from the two groups did not differ for any items.

The cost and response rates for each group by mailing wave are reported in Table 2. Aggregate costs were higher for the $5 group than for the $2 group, although the substantially higher response rate in the $5 group narrowed this difference at the level of cost per response. Indeed, the cost per response in the $5 group would have been lower than that of the $2 group if the cost of each mailed packet were only 33 cents greater than the $2.05 reported in Table 1. Slightly higher printing, postage, or handling costs easily could increase costs by 33 cents.

In both groups, response rates dropped steeply after the first mailing. Given this finding, we calculated that, for the same observed cost of $3,299, 215 of the 500 subjects in the $2 group instead could have received a $5 incentive in the first mailing. The additional $3 per subject necessary to increase this incentive for 215 subjects comes from the $597 in costs saved by foregoing the

TABLE 2. Costs and Response Rates by Incentive and Mailing Wave

	$2 Incentive	$5 Incentive
Wave 1 mailing (*n*)	500	500
Cost ($)	2,025	3,525
Usable responses (no.)	168	239
Cumulative response rate[a] (%)	34.9	49.4
Wave 2 mailing (*n*)	330[b]	275[b]
Cost ($)	677	564
Usable responses (no.)	33	31
Cumulative response rate[a] (%)	41.7	55.8
Wave 3 mailing (*n*)	291	238
Cost ($)	597	488
Usable responses (no.)	20	26
Cumulative response rate[a] (%)	45.9	61.2
Total cost ($)	3,299	4,577
Usable responses (no.)	221	296
Total cost/usable response ($)	14.93	15.46

[a]Based on 18 bad addresses in the $2 incentive group and 16 bad addresses in the $5 incentive group.
[b]Some second wave mailings were sent to those who responded late to the first mailing.

third mailing and from the higher response rate now expected after the first mailing, which lowers the cost of the second mailing to nonresponders. These results are shown in Table 3 and reveal that, for the same investigator cost, 231 responses would be expected instead of the observed 221 responses. Similarly, if resources otherwise devoted to the second and third mailings instead were used to raise the financial incentive for 425 of the 500 subjects, the same overall investment would be expected to yield 228 responses (calculations not shown).

Discussion

This study yielded several observations. First, we found a higher response rate with the $5 incentive than with the $2 incentive. We expected there might be a difference in response rates for the two incentives, but wondered whether the

TABLE 3. Theoretical Results of Redirecting the Third Wave Costs Into Higher Initial Incentives for 215 of the 500 Subjects Originally Assigned to the $2 Group

	Incentive		
	$2 Group	$5 Group	Combined Total
No.	285	215	500
Total cost ($)	1,540	1,758	3,298
Expected usable responses (no.)	115	116	231
Total cost/expected usable responses ($)	13.39	15.15	14.28

Note: The combined total cost of this program is similar to the cost for the $2 group in Table 2, but the number of usable responses here is higher.

novelty of the $2 bill would offset its lower monetary value. Such a finding would have identified an important cost-saving opportunity in mail survey research. Instead, we found a large improvement in response rate with the $5 incentive.

Second, we found a steep decline in interval response rates with successive mailing waves. The diminishing returns on subsequent mailings is well known and was expected; however, when combined with the first observation, this finding leads naturally to a practical suggestion: investigators contemplating three mailing waves should consider redirecting resources budgeted to the third wave into the initial financial incentive instead.[10] Our results suggest that such a strategy raises the overall response rate and is economically efficient because a high response rate at the end of the first wave reduces the number of additional packets mailed in subsequent waves. For the same reasons, Berk et al[11–13] found that financial incentives provided by checks (which typically are not cashed by nonresponders) were more effective in a survey of physicians when provided to all subjects with the first mailing rather than provided only to initial nonresponders at the second mailing.

We do not want our calculations in Table 3 to imply that investigators should use a mixed strategy of different incentive sizes when facing a limited budget. Rather, we suggest that, in general, limited resources would be more efficiently used to increase the initial incentive than to embark on a third mailing wave. Even so, our conclusions are limited by the small size and scope of this study. Further, an implicit assumption in such manipulations is that different financial incentives affect overall response rate but do not contribute to nonresponse bias. In this study, we found no differences between respondents or their responses across the two groups. This finding suggests that, although overall responders may have differed from nonresponders, the incentive strategy did not contribute additional bias. In contrast, in a study examining the effects of a prepaid $5 incentive versus the promise of a $5 incentive on questionnaire return, Schweitzer and Asch[12] found that subjects with lower salaries were more likely to respond when paid in advance. Although journal editors, reviewers, and readers often focus on response rates when evaluating surveys, in the end the real issue is bias. So long as one has a sufficient number of cases for statistical analyses, low response rates are not a problem in themselves. Although there are more opportunities for nonresponse bias when response rates are low rather than high, there is no necessary relationship between response rates and bias.[1]

Physicians chosen at random are particularly hard to reach for survey research. Although other studies have demonstrated an increase in response rates seen with increasing financial incentives and the diminishing marginal returns provided by second and third mailings, the present study suggests, in addition, that resources in a fixed survey budget are allocated more efficiently to increasing the initial incentive rather than to conducting a third wave mailing to nonresponders.

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