A BRIEF ORIGINAL CONTRIBUTION

Improvement in Cumulative Response Rates following Implementation of a Financial Incentive

Erin Gilbart\(^1\) and Nancy Kreiger\(^1,2\)

Risk estimates arising from case-control studies can be unreliable if the level of response to mailed questionnaires is inadequate. Several studies have reported improved early response rates to mailed questionnaires following the implementation of financial incentives. Improvements in cumulative response rates at the completion of the follow-up period, however, have not been as pronounced. A financial incentive of $5.00 was implemented among control subjects in a large population-based case-control study of Ontario, Canada, women. Required follow-up time and effort were decreased for the controls who received the incentive compared with those who did not. More importantly, cumulative response rates after more than 20 weeks were 20 percent higher among controls who received the incentive. Am J Epidemiol 1998;148:97-9.

case-control studies; data collection; questionnaires; reimbursement, incentive

Rates of response to self-administered, mailed questionnaires have tended to be problematic in epidemiologic research. The consequence of low response is an increased potential for response bias in risk estimation. A number of studies have reported improved response rates following the implementation of various monetary incentives (1-4). Specifically, cash payments have been shown to improve response rates more than other financial incentives, such as lottery tickets, raffles, or payment upon return of the questionnaire (2). The majority of studies have shown improvements in early response rates, but cumulative response rates have not increased as dramatically (2, 4). Thus, financial incentives may reduce follow-up time and effort by improving early response; the evidence suggests that improvements in final response are minimal.

MATERIALS AND METHODS

A financial incentive was implemented in an ongoing case-control study designed to investigate the relation between use of antidepressant medication and subsequent risk of breast cancer in Ontario, Canada. Cases were women aged 25-74 years who had been newly diagnosed with a primary malignancy of the breast between June 1996 and May 1997. Controls were frequency-matched by age to the cases, and were randomly selected from the Ontario Ministry of Finance assessment rolls. These assessment records include all homeowners and renters residing in the province of Ontario, and are used for generating property assessment and taxation information.

A 20-page mailed questionnaire with an explanatory cover letter was sent to all subjects, and a stamped, addressed envelope was provided for its return. The questionnaire asked about reproductive history, medication use, psychiatric history, diet, exercise, and smoking patterns. Two weeks after the initial mailing, a reminder postcard was sent to the subjects asking those who had not returned the questionnaire to do so as soon as possible, and thanking those who had already sent it back. After an additional 2 weeks, a follow-up telephone call was made to subjects who had not yet responded. A second questionnaire was sent to those subjects who requested one.

While the response rate among cases has consistently hovered around 75-80 percent, the response rate among controls had been 50 percent or less. We initially hypothesized that the low response rate among controls was due to an uneven age distribution, since the first control mailing comprised mostly older subjects. The response rates among younger controls, however, were still significantly lower than expected (50 percent vs. 75 percent). We also examined the geographic distribution of respondents versus nonrespondents (data not shown), since there is evidence...
that urban response rates are lower than rural rates (5). While we did find that the response rate among controls residing in heavily urbanized areas was much lower than that among those living in other areas of the province (42 percent vs. 55 percent), the level of response among both groups was unacceptable. Thus, in 1997 we implemented a financial incentive among the controls in an attempt to improve their response rates. With the questionnaires sent to controls, a $5.00 bill is now placed in a small windowed envelope with the message, “Please accept this token of our appreciation for your help with this study.” Five-dollar bills were chosen because they are the smallest paper currency available in Canada.

RESULTS

Figure 1 shows the response rates among cases and controls receiving no incentive and among the controls receiving the incentive, as of March 1998. Twenty weeks after the initial mailing, the response rate among controls who received the financial incentive was 20 percent higher than that among those who did not. The response rate among the controls receiving the incentive nearly equaled that of the cases. Interestingly, improvements in early response rates (i.e., at 4 weeks) were quite dramatic among the controls who received the incentive, and control response actually surpassed that of the cases in the first 4 weeks following questionnaire mailing.

The incentive yielded the greatest improvement among the older age groups (a 15–30 percent increase), but it also improved response by 5–10 percent among the younger controls (data not shown). Geographically, both urban and rural dwellers showed significant improvement with the financial incentive, although the difference in response rates between the two groups is still pronounced (63 percent among Toronto-area controls vs. 74 percent among controls living in other areas of the province).

DISCUSSION

The implementation of a financial incentive among controls in this population-based case-control study had a dramatic effect on both early and cumulative response rates. Although the controls were not randomly assigned to incentive payment, there was no difference in age or geographic distribution between controls who received the incentive and those who did not.

The decision not to implement a similar incentive among the cases was based on a number of considerations. First, the response rate among cases was considered to be acceptable and was consistent with rates observed in other case-control studies we have conducted. Second, the financial burden of implementing such an incentive in a group that seemed relatively eager to respond without one did not seem cost-effective. While it is likely that response rates would have increased among cases with the use of a financial incentive, we expect that it would have been less than the 20 percent increase observed among the controls.

Finally, a financial incentive might actually be a disincentive to participation for cases who may find this to be an inappropriate expenditure of funds directed toward cancer research. Thus, because of financial constraints, the adequate case response level, and the potential for jeopardizing case participation, we decided that the incentive would only be offered to the controls. Future research in the area of financial incentives and ethics could focus on possible barriers to participation in such studies. One could argue that by not providing the cases with a similar incentive, we have created something of an ethical dilemma: penalizing participation among cases while rewarding non-response among their control counterparts.

The implementation of a $5.00 financial incentive among controls in this study resulted in dramatic improvements in both early and final response. The amount of time and effort involved in telephone follow-up was greatly reduced following implementation of the incentive. It appears that financial incentives may improve response rates and should be considered when minimization of response bias takes precedence over financial concerns.
ACKNOWLEDGMENTS

This research was supported in part by the Canadian Breast Cancer Research Initiative.

REFERENCES