

The Effect of Cash Lottery on Response Rates to an Online Health Survey among Members of the Canadian Association of Retired Persons: A Randomized Experiment

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ABSTRACT

Objectives: The objectives of the study were 1) to assess the effect of cash lottery on participation rates in a web-based study of physical activity and joint health and 2) to compare recruitment via direct e-mail versus advertisement in an online newsletter.

Methods: A sample of 1,150 individuals, randomly selected from a database of members of the Canadian Association of Retired Persons (CARP), was e-mailed a request to participate in an online survey, with follow-up e-mails after 1 and 2 weeks. The sample was randomly split into two groups. Half the sample was offered entry into a cash draw with a \$500 grand prize and five \$100 prizes, whereas the other half was not offered any incentive. In addition, a brief advertisement about the survey (without an incentive) was placed in an online newsletter that was circulated to 14,000 randomly selected CARP members.

Results: In the incentive group, 305 (53.0%) clicked on the hyperlink and visited the website and 84 (14.6%) completed the survey. In the group who received no incentive, 280 (48.7%) clicked on the link and 59 (10.3%) completed the survey. Of those who received the online newsletter, 492 (3.5%) visited the website and 106 (0.76%) completed the survey.

Conclusion: A relatively modest financial incentive in the form of a cash lottery significantly increased participation rates in an online health survey. Recruitment through a newsletter advertisement had a very low yield compared to direct e-mail.

Key words: Internet; survey; response rates; incentives

La traduction du résumé se trouve à la fin de l'article.

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Financial incentives as a technique to improve response rates in mail surveys have been studied extensively, both in the social science¹⁻⁴ and epidemiological literature.⁵⁻¹⁰ These studies generally concluded that the most effective incentive is a token cash reward (usually between 1 and 5 dollars) included upfront with the questionnaire.^{1, pp. 238-42} This technique is consistent with the social exchange theory of survey participation and has consistently produced a greater increase in response rates than non-monetary upfront incentives (e.g., pens, gift certificates) or promised incentives, such as payments for returned questionnaires or lotteries.^{1-4,10} However, the token monetary incentive is difficult to use in Internet-based surveys in which subjects are recruited via e-mail. Instead, researchers have employed other types of incentives that have been effective in mailed surveys. In particular, cash lotteries have commonly been used.^{1,2,8-10} The effectiveness of these incentives in the context of Internet surveys remains controversial. In a meta-analysis of 26 studies comparing incentives to no incentives, providing financial incentives increased the response rate significantly, with the odds ratio of 1.5.¹¹ However, several experiments that looked specifically at cash lotteries did not show a significant effect.¹²⁻¹⁴

There has been little research on the effect of cash lotteries and other incentives in the context of epidemiological Internet-based research. The effect of a lottery may depend on the target population and other factors that influence response rates, such as salience of the topic, number of contacts, or length of the questionnaire.¹ As

part of a feasibility study of an Internet-based longitudinal study of knee and hip health among members of the Canadian Association of Retired Persons (CARP), we examined the effect of a cash lottery on participation rates in an online health survey. In addition, we compared two recruitment strategies: direct e-mail and general advertisement in an electronic newsletter.

METHODS

An invitation to participate in a survey of physical activity and joint health was sent via e-mail to 1,150 individuals randomly selected from a database of 28,000 CARP members who had agreed to receive such e-mail. The e-mail contained links that allowed participants with HTML-equipped e-mail software to access the website with one mouse click. All e-mails contained a personal letter from the principal investigator, a short description of the study, a contact

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e-mail address for questions or assistance, and a list of participating organizations. Half of the subjects were randomly allocated to receive an e-mail that contained the incentive, while the other half received a message with no financial incentive. The incentive was an automatic entry into a draw in which \$1000 (CAD) was divided into six prizes: one \$500 grand prize and five \$100 prizes. The lottery was not mentioned in the e-mail subject line, it was found only in the message text. No additional information about the lottery or the odds of winning was provided on the website. Reminder e-mails, also containing embedded links to the survey and repeating the incentive or message without incentives, were sent one and two weeks after initial contact. The follow-up e-mails were sent to the entire group but contained a thank you message for those who had already completed the survey.

In addition to the e-mail invitation, a general announcement of the survey (40 words) was placed in an online newsletter that was circulated to 14,000 CARP members randomly selected from a database of 100,000 newsletter recipients. The text of the newsletter advertisement was different from the e-mail; it contained a very brief description of the study and a request for help. No incentive was included. The announcement also contained a link to the study website.

After reaching the website, participants were asked to complete an electronic consent form to access the survey. Access to the questionnaire was controlled by a password e-mailed to the subject immediately after completion of the electronic consent form and provision of a valid e-mail address. The password consisted of a randomly generated 8-digit mixed alphanumeric code. This process ensured that only people with valid e-mail addresses could participate. In addition, the system prevented participants from using the same e-mail address to complete the questionnaire multiple times.

The online survey had 33 questions on demographics, socioeconomic status, physical activity (sport, occupational and domestic), diagnosis of arthritis, previous and current knee pain, and computer usage. We also asked about incentives that would encourage participation in online research projects. Data were collected on the number of people who completed the questionnaire and those who visited the website but did not complete the survey (click rates). There were 9 screens used to present the survey with an average of 4 (range 1-7) questions per screen. Question types included drop-down boxes, text fields, radio buttons, and check boxes.

The data were collected between January and April 2003. All data were stored electronically in files that could be imported directly into statistical analysis software. We compared response rates (proportions) between the intervention groups. Data analysis was conducted using SPSS version 11.5. The project was approved by the Behavioural Research Ethics Board of the University of British Columbia.

RESULTS

A total of 284 subjects consented and completed the questionnaire. Of those, 60.9% were women (Table 1). Mean age for the sample was 61 years and 10.4% were 70 years of age or older. University or college degrees were reported by 41.9% of the subjects and 9.6% reported less than secondary education. The average number of years participants reported using the Internet was 6 years and the average number of hours of computer use per week was 20 (data

Table 1. Characteristics of the Study Population

	N (%)
Age (years)	
<50	10 (3.6)
50-59	110 (39.3)
60-69	131 (46.8)
70+	29 (10.4)
Unreported	4 (1.4)
Sex	
Male	110 (39.1)
Female	171 (60.9)
Unreported	3 (1.1)
Education	
Less than secondary	26 (9.6)
Secondary graduate	121 (44.5)
Other post-secondary	11 (4.0)
Post-secondary graduate	114 (41.9)
Unreported	12 (4.2)

not shown). Where reported, the Internet connection used most by participants was 'dial-up modem'. However, the type of connection was not provided by 33% of the respondents.

The overall proportion of subjects who completed the questionnaire was 14.6% (84/575) in the group receiving e-mails with incentive, compared to 10.3% (59/575) in the non-incentive e-mail group (p=0.03) (Table 2). Slightly more subjects in the incentive group clicked on the hyperlink to the website (53.0% vs. 48.7%) but the difference was not statistically significant (p=0.30). Of those, 84/305 (27.5%) in the incentive group completed the survey, compared with 59/280 (21.1%) in the non-incentive group. Of the 14,000 subjects who received the newsletter, 492 (3.5%) clicked on the hyperlink and 106 (0.76%) completed the questionnaire. An additional 35 participants completed the survey from unknown sources, presumably referred by other participants who received the e-mail or newsletter advertisements.

Among the incentives that participants said would encourage future participation in online surveys, a joint health information package was indicated by 65.5% of the participants, a summary of the study results by 60.9%, links to joint health information websites by 47.9% and a lottery by 33.8% (Table 3). The majority of the participants (85.9%) reported that a key factor in their decision to complete the survey was "the satisfaction of helping with important research".

DISCUSSION

In this study, a cash draw with six prizes totaling \$1000 increased the response rate to a web-based survey from 10.3% to 14.6%, i.e., a relative improvement of more than 40%. The incentive did not significantly increase the number of people who chose to follow the e-mail to the website (initiation), but did increase the participant's willingness to complete the questionnaire (retention). About half of the people receiving direct e-mail clicked on the hyperlink to the study website. Of those, 28% in the incentive group and 21% in the non-incentive group completed the survey. By comparison, among persons receiving an online newsletter, only 3.5% clicked on the hyperlink. However, of those who did, the proportion completing the survey was similar to that found in the non-incentive e-mail group. Although recruitment using an advertisement in an online newsletter produced a very low yield compared to direct e-mail, this approach may generate a significant number of responses at a relatively low cost if the sampling frame (database) is very large. An additional 35 people participated in the project who did not belong to any of the target groups and were likely drawn to the

Table 2. Number (%) of Participants Responding to the Survey According to Recruitment Strategy

	Incentive E-mail N = 575	Non-incentive E-mail N = 575	Online Newsletter N = 14,000
Clicked on hyperlink	305 (53.0)	280 (48.7)	492 (3.5)
Completed survey	84 (14.6)	59 (10.3)	106 (0.76)

Table 3. Reported Frequency of an "Encouraging" Effect of Four Types of Incentives on Participation in Future Surveys

Incentive	N (%)
Joint health information package	186 (65.5)
Summary of study results	173 (60.9)
Links to joint health information websites	136 (47.9)
Cash lottery	96 (33.8)

study through "snowballing".⁹ This technique has the potential to generate a non-trivial number of additional subjects for an Internet-based study.

Previous studies looking specifically at the effectiveness of cash lotteries in Internet surveys produced conflicting results. Göritz¹⁵ compared 6 types of cash lotteries vs. no incentive in a non-profit online panel. None of the cash lotteries increased response. Similarly, studies by Brennan et al.,¹² Cobanoglu and Cobanoglu,¹³ and Porter and Whitcomb¹⁴ found no significant effects of lotteries. These studies led Dillman and colleagues to conclude that "lotteries and prize drawings do not increase response rates significantly".^{1, p. 274} However, in a four-wave panel study, Göritz observed an effect of a lottery on participation in the first wave.¹⁶ Bosnjak and Tuten¹⁷ compared prepaid online money transfer with postpaid incentives and prize draws among members of a professional association in Virginia. In contrast to previous studies, the prize draw was the only incentive that was significantly better than no incentive. In a meta-analysis of 26 online experiments comparing various financial incentives (including but not limited to lotteries) to no incentive, Göritz¹¹ found an overall odds ratio of 1.5, i.e., identical to the odds ratio in our study.

A response rate of 15% is lower than typically observed in mailed surveys in the general population. Internet surveys in special populations, such as patients, physicians, students, or university professors, have achieved response rates comparable to or slightly lower than mailed surveys.^{1,18-20} Published data on responses in more diverse populations and among older persons are limited. A number of factors other than incentives affect response rates to Internet surveys.¹ These include the same factors that determine responses to mailed surveys, such as the target population under study, salience of the topic, number of contacts and length of the questionnaire. Our survey of CARP members asked about physical activity and joint health, a topic that is probably of some interest to this population. The survey was moderately long (33 questions) and multiple contacts were used to maximize responses. The proportion of undeliverable e-mails was likely small because the database was updated regularly.

While we do not have data to compare respondents with non-respondents, the response rate observed in our study is too low to ensure representativeness of the sample. Therefore, Internet-based data collection with subject recruitment via e-mail is not optimal for general population surveys of older Canadians, especially if a probability sample is required. It should be noted that response rates to mailed surveys have been declining in the past decade and

the same may be true for Internet surveys.¹ In a recent Canadian study using direct e-mail to registered members of a youth health website reported a response rate of only 0.24% despite monetary incentives,²¹ although this may have been partly due to difficulties distinguishing study-related messages from "spam" and misinformation. On the other hand, Dillman et al.¹ reported >40% response to a web-based survey in which the initial contact was by mail, with a token cash incentive included upfront. This suggests that a mixed-mode method may achieve response rates approaching those of mailed surveys, while retaining some of the advantages of web-based data collection.

Additional factors that may influence response rates in Internet surveys include the ease of login, password, and speed of the Internet connection. Some problems we have encountered with the Internet-based data collection deserve a comment. The login process for this survey was considered quite difficult by a substantial number of participants and a simplified log-in procedure would likely improve overall response rates. We received 28 e-mail messages asking for help logging into the website. Common problems included mistyping the password and mistaking zeroes for the letter O or the number one for a lowercase L. We do not have data on how many potential participants visited the site but could not successfully complete the login procedure and abandoned the project. The requirement for an e-mailed password to access the survey also added an additional level of complexity to the sign-up process that may have reduced the overall participation rate. The use of unique e-mail addresses to reduce the chances of participants filling out the survey multiple times is not an ideal solution to this problem. It is possible for users to create new e-mail accounts and complete the survey again.

The Internet connection question was included in this survey to help determine the speed of the average users' Internet access. We were concerned that a questionnaire with demanding bandwidth requirements would reduce the accessibility or frustrate the user with long load times between question pages. Our results suggest that older users tend to connect to the Internet with low-speed connections and surveys should avoid using large images or complicated graphics, although this issue may become less important as the technology progresses rapidly. The poor overall response to this question suggests that the users may not know how they connect to the Internet. This is in contrast with the relatively large amount of time participants reported using their computers during an average week.

In conclusion, relatively low response rates can be expected in online surveys in the general older population of Internet users. Although altruism was the most prevalent reason offered for completing the survey, a relatively modest financial incentive in the form of a cash lottery significantly improved response rates, resulting in a 40% relative increase in participation (odds ratio 1.5) compared with the non-incentive group. Our results also show that direct e-mail is much more effective for recruiting participants than general advertisement in an online newsletter.

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RÉSUMÉ

Objectifs : 1) Analyser l'effet d'un tirage de prix en argent comptant sur les taux de participation à une étude en ligne sur l'activité physique et la santé articulaire et 2) comparer le recrutement direct par courriel à la publication d'une annonce dans un bulletin en ligne.

Méthode : Nous avons demandé par courriel à un échantillon de 1150 personnes, sélectionnées au hasard dans la base de données des membres de l'Association canadienne des individus retraités (ACIR), de participer à un sondage en ligne, et nous leur avons envoyé des messages de suivi après 1 et 2 semaines. L'échantillon a été divisé en deux groupes de façon aléatoire. La moitié de l'échantillon s'est fait proposer de participer à un tirage de prix en argent comptant (un grand prix de 500 \$ et cinq prix de 100 \$), tandis que l'autre moitié n'a reçu aucune incitation. Par ailleurs, une brève annonce à propos du sondage (sans mesure incitative) a été publiée dans un bulletin en ligne envoyé à 14 000 membres de l'ACIR sélectionnés au hasard.

Résultats : Dans le groupe ayant reçu une incitation, 305 personnes (53 %) ont cliqué sur l'hyperlien et visité le site Web, et 84 (14,6 %) ont répondu au sondage. Dans le groupe n'ayant pas reçu d'incitation, 280 personnes (48,7 %) ont cliqué sur le lien et 59 (10,3 %) ont répondu au sondage. Parmi les personnes ayant reçu le bulletin en ligne, 492 (3,5 %) ont visité le site Web et 106 (0,76 %) ont répondu au sondage.

Conclusion : Une incitation financière relativement mineure – le tirage de prix en argent comptant – a significativement accru le taux de participation à un sondage en ligne sur la santé. Le recrutement au moyen d'une annonce dans un bulletin a donné des résultats beaucoup moins bons que l'envoi direct de courriels.

Mots clés : Internet; questionnaires; taux de réponse; mesures incitatives

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