Higher monetary incentives led to a lowered response rate in ambulatory patients: a randomized trial

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Abstract

Objectives: Monetary incentives can increase response rate in patient surveys, but calibration of the optimal incentive level is required. Our aim was to assess the effect of different monetary incentives on response rates to calibrate the optimal monetary incentive for ambulatory patients.

Study Design and Setting: A patient-randomized trial was performed in which targeted individuals received different gift vouchers (€5.00, €7.50, €10.00, and €12.50) on completion of a survey and interview. Eligible patients (diagnosed type 2 diabetes, over 18 years) were recruited from primary care practices.

Results: The response rate for the €12.50 incentive was lower compared with both the €7.50 and the €10.00 incentive [odds ratio (OR) = 0.60 and OR = 0.58]. A nonlinear model yield a better fit than a linear model. Within the observed range of incentive levels, an overall decrease in response rate was found.

Conclusion: High monetary incentives are not only inefficient but also less effective. © 2015 The Authors. Published by Elsevier Inc.

Keywords: Response rate; Incentives; Survey; Monetary incentive; Ambulatory patients; Diminishing returns; Deprivation

1. Introduction

Low response rates in a sample of individuals who have been invited for a study induce a risk of selection bias and increase research costs. A range of interventions to enhance response rates has been tested, with variable and overall small-to-moderate effects [1]. Monetary incentives have been applied to enhance survey response rates and showed an overall positive effect with an odds ratio (OR) of 1.87 [1,2]. Offering money may be perceived to compensate for the individual’s time and to express appreciation for the willingness to participate. Increasing the amount of the incentive has been found to result in a higher response rate (OR, 1.26) [1], although a meta-analysis suggested that this effect flats out at higher incentive levels, resulting in marginal increases for highest incentives [3,4]. Therefore, calibration of the optimal monetary incentive to enhance response rates for a specific study population is still an important task [5]. Given the decreasing relative value of money with increasing individual income, the effect of monetary incentives may be highest in low-income populations.

In this study, we aimed to assess the effect of different monetary incentive levels on response rates in a written survey and telephone interview in ambulatory diabetes patients. As we targeted individuals in both economically deprived as affluent areas, we were also interested the explore differences across geographic deprivation levels regarding the impact of monetary incentives. Overall, we expected that higher incentives lead to a higher response rate but with diminishing returns as the amount of the incentive increases. Moreover, we expect this curve to flat out at higher incentive levels in deprived areas as compared with affluent areas.

2. Methods

A patient-randomized trial with four arms was performed in the Netherlands, in which targeted individuals received different gift vouchers on completion of the survey. The trial was integrated in an international,
Monetary incentives can increase the response rate in studies, although the effect flattens out at higher incentive levels. This study shows that there is a potential risk that a high incentive is not only inefficient but also less effective. Researchers should be aware of this effect when they choose the amount for an incentive.

observational multicenter study in primary care, which is described elsewhere [6]. The ethical committee Arnhem-Nijmegen waived approval for the response trial [2013/098], which was registered with Current Controlled Trials ISRCTN95158258. Data were collected in the year 2013.

2.1. Study population and setting

Eligible patients (diagnoses of type 2 diabetes, age 18 years or over) were recruited from primary care practices in three regions in the Netherlands: an urban deprived region, an urban affluent region, and a rural deprived region. At the primary care practice, patients were given an invitation letter, which described the study and a written questionnaire. We planned to recruit a sample of 100 individuals in each region.

2.2. Interventions to enhance response rates

Patients were randomized to study arms within each general practitioner (GP) practice. At the GP practice, the patient was handed over an anonymous and closed envelope with the questionnaire and in which a specific monetary incentive was offered. Respondents were offered one of four incentive levels: €5.00, €7.50, €10.00, and €12.50. Neither the researcher nor the contact person at the GP practice knew the amount of money that was offered. Patients were asked to complete a questionnaire, which took about 15 minutes, and to participate in a telephone interview, which took an additional 15 minutes. The incentive was delivered on completion of both the questionnaire and telephone interview.

2.3. Outcome and statistical power

The primary outcome of this study was completion of the written survey and the telephone interview. The study was powered to detect a medium effect size (Cohen’s d 0.3; OR, 1.72) between the incentive groups.

2.4. Statistical analyses

The response rate in each study arm was calculated, overall and within the three different regions (subgroup analysis). To test the effect of an increase in level of incentive, we performed a logistic regression analysis with the €5.00 as reference. We determined the fit of regression models with linear and nonlinear terms. We tested (1) whether the incentive level had a linear effect vs. no effect and (2) whether a nonlinear model fitted better than a linear model with the observed response rates. To estimate a nonlinear model, we added the square of the incentive in euros to the model. A loglikelihood ratio test was used to compare the fit of these models.

Linear model:  
\[ Y = B_0 + B_1 \cdot \text{incentive} + e \]

Nonlinear model:  
\[ Y = B_0 + B_1 \cdot \text{incentive} + B_2 \cdot \text{incentive}^2 + e \]

3. Results

In total, 520 individuals were invited and handed over a questionnaire. Out of these 520 invitations, 232 completed the questionnaire and participated in the telephone interview. This resulted in an overall response rate of 44.6% (not shown). The response rate was 40.2% for the lowest incentive level (€5.00), 50.0% for €7.50, 50.9% for €10.00, and 37.6% for the highest incentive of €12.50 (Fig. 1).

The response rates showed variation between the regions: 37.0% in the urban deprived region, 45.3% in the urban affluent, and 53.7% in the rural deprived region (not shown). The effect of the incentive seemed to vary between regions. In the urban deprived region, the response rate was nearly the same for different incentive levels, whereas the urban affluent and rural deprived showed the highest response rate at an amount of €7.50 and €10.00 euro and the lowest at €5.00 and €12.50.

Logistic regression analysis showed that the response rate for the €12.50 incentive was significantly lower than for the €7.50 as the €10.00 incentives (OR = 0.60 and OR = 0.58, respectively). Other effects were not significant. The linear model did not have a better fit than the base model with no effect. The nonlinear model of incentive
levels on response rates had a significantly better fit ($\chi^2(1) = 13.9, P < 0.001$). The negative parameter for $B_2$ ($-0.037$) indicated that an increase in incentive resulted in a diminishing response rate. In the observed range of values for incentives, we found a decline in response rate that implicates that the ceiling of the effect of incentives on response rate was reached (Fig. 1).

4. Discussion

This study showed a nonlinear relationship between the size of the monetary incentive and the response rate in a survey of ambulatory patients. Offering more money had positive impact on response rates but only up to a point. To our knowledge, this is the first trial in ambulatory patients that showed decreased response rates for higher monetary incentives. We found no evidence for the hypothesis that monetary incentives have higher impact in deprived areas.

The study has a robust design, but generalizability to other populations and settings is an issue for future studies. For example, patients with type 2 diabetes are relatively old; younger populations might have different considerations to participate. Because of the chosen method (handing over questionnaires at a GP practice), we did not have name and addresses of the nonrespondents and therefore we were not able to correct for potential nonresponse bias.

Although the positive but diminishing marginal effect of increased monetary incentives is consistent with previous studies [7], we can only speculate about the reasons for the decline of response rates for highest incentives. Dillman [8], who described questionnaire response in terms of a social exchange, suggested that when the amount of an incentive (rewards) approaches that of the effort to complete a questionnaire (costs), the response may decline. Part of this social exchange is the idea of reciprocity, the balance in “gifts” between two subjects [9]. If the incentive is perceived as too high for the effort, people feel that the “norm of reciprocity” is imbalanced and may withdraw themselves from participation. However, this effect has not been found in recent studies [5]. Alternatively, the finding may suggest that offering money to enhance response rates is mostly perceived as an appreciation of effort and less as realistic compensation of time involved in study participation. Also, a high incentive may be perceived to indicate high burden for responders or suggest other negative experiences. An important implication of our finding is that calibration of the size of monetary incentives to enhance response rate is required because high incentives are not only inefficient but also less effective.

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References