# Cost-effectiveness of follow-up contact for a postal survey: a randomised controlled trial

# Abstract

**Objective:** This study examines the effectiveness and costs of follow-up phone calls in improving response rates to a community survey.

Methods: Non-responders to a postal survey were randomly allocated to receive a phone call or no phone call. The resources used for the development and implementation of the survey were documented. The response rates and cost per level of follow-up contact examined. Results: Follow-up phone calls led to a statistical significant increase in the number of responses to a communitywide survey, relative to no phone call. This relative increase in responses (n=62 for the follow-up phone call group versus n=1 for controls), did not increase the absolute survey response rate sufficiently (from 38.5% for two mailed surveys to 39.8% for two mailed surveys plus a phone call) to justify the phone call costs. Scenario analyses show increasing the initial response rate by 10% and conducting a second mailed survey achieves greater marginal cost savings than increasing the response rate to the second mailout or the follow-up phone calls.

**Conclusions:** These results suggest a follow-up phone call was not cost effective. Survey research ought to primarily focus on obtaining optimal initial response rates by using strategies identified in a Cochrane meta-analytic review.

*Key words:* response rate, non-response, survey, follow-up, cost, randomised controlled trial.

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ostal questionnaires are a relatively inexpensive method for collecting research information and often the only financially viable option when collecting data from large, geographically dispersed populations.<sup>1</sup> Surveys also provide detailed information on health behaviours that cannot be obtained from routinely collected data sources. A major disadvantage of mail surveys, however, can be low response rates, which limits the external validity of the data.

A community survey investigating alcohol consumption and harm in 20 communities in rural NSW, Australia, incorporated the effective principles identified in a Cochrane meta-analytic review of strategies to optimise survey response rates:1 the length of the questionnaire was limited to a 15-minute completion time; correspondence with recipients was personalised; a second copy of the questionnaire was provided at follow-up; the questionnaire used simple language (with a reading age appropriate for 12-year-olds); was printed in colour and clearly displayed university sponsorship. Confidentiality was assured. In addition, a standardised media release was provided to the local newspaper in all towns to highlight the importance of the study. Strategies

identified in the meta-analysis but not used were pre-notification, first-class mailing and recorded delivery (all too expensive for this study), stamped instead of franked envelopes (too impractical) and a monetary or non-monetary incentive (disallowed by the ethics committee that approved the study).

Although additional follow-up attempts by mail and telephone have been shown to be effective, there is limited research on the cost-effectiveness of these methods.<sup>2</sup> Phone calls to those who do not respond to a mailed survey can be considered intrusive and are resource intensive, in terms of phone call and staff costs, and time.

This study uses a randomised controlled trial design to quantify the effectiveness and costs of follow-up phone calls to nonresponders of a mailed community survey.

## Method Survey design and implementation

The postal survey was designed to maximise reliability, validity and comparability with other major Australian community datasets, and minimise response bias. Questions from standardised instruments were included where possible,<sup>3,4</sup> or from

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existing questionnaires where no reliable or valid measure was available. To check content validity, a group of senior researchers in the alcohol and drugs field reviewed the survey prior to implementation. A customised database was developed to enable tracking of the surveys and streamline data entry. These activities were included in the costing of the survey.

A random sample of 7,985 names and addresses on the electoral roll for 20 postcodes of interest were provided by the Australian Electoral Commission (AEC). Voting is compulsory for people aged 18 years and over and the electoral roll is routinely updated. The electoral roll provides access to a more representative sample of the Australian population than other methods: sampling from the telephone directory, for example, identifies approximately 58% of potential survey participants,5 while e-mail surveys are restricted to populations with e-mail accounts (e.g. university students).6 The sample consisted of 18-62 year olds and was selected using the age and gender distribution of the towns according to 2001 Australian Census data: 18 coincides with the minimum age for voting in Australia and those over 62 contribute relatively little to alcohol-related harm.7 The 20 communities were selected as part of a randomised controlled trial investigating the impact of community interventions to reduce alcohol harm.8

The surveys, with personalised cover letter, were sent in March 2005 and the returns tracked. A week later, a reminder to complete the survey, or a thank you for returning the survey and participating in the study, was sent. Three weeks after the initial survey was sent, a second reminder survey was mailed to those who had not responded.

#### Follow-up phone calls

Nine weeks after the initial survey was sent (and four to six weeks after the follow-up survey was sent), phone numbers were sought for the non-responders aged 18-37 years (n=2,178). This age group was selected as they represented almost half (48%) of all non-responders to the mailed surveys (n=4,575) and because young people experience disproportionately high rates of alcohol-related harm.<sup>9</sup> White Pages Online was used to find a contact phone number (AEC cannot provide telephone details). Previous research using a similar methodology<sup>5</sup> obtained corresponding phone numbers for 58% of survey participants, comparable to the 1,221 (56%) of phone numbers obtained for this study.

These 1,221 non-responders with a telephone number were stratified by age group and gender, and randomly allocated to either receive a follow-up phone call (intervention group, n=611) or no further communication (control group, n=610). Up to five phone

calls were made to each participant at different times of the day (with a minimum of four attempts). Respondents were asked if they had received the survey, if they were willing to complete it and, if not, the main reason they would not participate.

The response rate was calculated as the number of surveys returned divided by the number of surveys sent out and not returned as undeliverable. This response rate is the maximum response rate as defined by the American Association for Public Opinion.<sup>10</sup>

#### **Resources and costs**

The resources used for the development and implementation of the survey were documented and valued in 2005 Australian dollars. Human resources were included for the survey (development, design and implementation), construction of the database and conduct of the follow-up phone calls. Other resources included printing and postage of the survey and subsequent reminders. Direct wage costs were used for the PhD candidate who developed the survey. Contractors were used for the database development, printing, mailout and follow-up phone calls.

#### Scenario analysis

A number of hypothetical scenarios were costed to examine their impact on the cost per survey. Specifically, the initial return rate was improved by 10% and 20% and the response rate to the second mailout increased by 10%.

### Results

#### Survey response rates by level of follow-up

Of the initial 7,985 surveys mailed, 200 were marked return to sender, indicating the person was no longer at the address supplied. The number of potential participants was therefore 7,785. Of these, 56 refused to participate and 2,361 surveys were returned completed. The response rate after the initial mailout and reminder/ thank-you letter was 30.3% (Table 1).

A second copy of the survey was sent to the 5,368 nonresponders. Since an additional 103 surveys were returned to sender, the number of potential participants became 7,682 (7,785 surveys, less 103 returned to sender). Of these, 96 refused to participate and 594 completed surveys were returned, resulting in a total of 2,955 returned surveys. The response rate after the second mailout was 38.5% (Table 1).

A contact was made for 83% (n=505) of the 611 participants randomly allocated to receive the follow-up phone call. Of these,

Table 1: Response rate by level of contact.						
	Mail out + reminder/ thank you	Two mail outs + reminder/thank you	Two mail outs + reminder thank you + phone call			
Potential participants <sup>a</sup>	7,785	7,682	7,580			
Number of surveys returned <sup>b</sup>	2,361	2,955	3,017			
Response rate <sup>c</sup>	30.3	38.5	39.8			

Notes: a) A subsample of 18-37 year old non-responders randomly selected to received a phone call.

b) number of surveys sent out – number of return to sender or not at address.

c) number of surveys returned/# potential participants.

102 of the participants did not live at the address, so that the final number of potential participants for the survey was 7,580 (7,682, less 102). Of the 7,580, 3,017 completed surveys were returned, giving a final overall response rate of 39.8% (Table 1).

#### Follow-up phone calls

There were no significant differences between participants randomly allocated to receive the follow-up phone call and those in the control group in terms of age and gender.

Of the 611 individuals randomly allocated to the follow-up group, 403 were potential participants (n=505 successful contacts, less 102 not living at the address). Of these, 33 refused to continue with the phone call (8%), 28 indicated they had already returned a completed survey (7%) and 12 were overseas, away or had died (3%). Of the 330 (82%) who continued with the phone call, 213 (65%) had received the survey, 99 (30%) had not and 18 (5%) did not know if they had received the survey. More than half (n=194, 58%) said they were willing to complete the survey, 135 (40%) were unwilling and one respondent did not know if they were willing to complete the survey were

Table 2: Cost of	survey devel	lopment and	implementation	1
and response.				

Cost of survey, mail out and reminder/thank-you le	etter (A)
Human resources to develop survey; track and enter survey data	\$21,815
Database development and support	\$4,935
Printing and mailout	\$29,362
Reply paid for surveys returned	\$2,561
Total cost of A	\$58,673
Number of completed surveys returned after mailout plus reminder	2,361
Cost per completed survey returned using mailout plus reminder / thank you	\$24.85
Additional cost of second mail out (B)	
Cost of second mailout to non-responders	\$10,404
Reply paid for surveys returned	\$697
Total cost of B	\$11,101
Number of completed surveys returned after second mailout (B)	594
Cost per completed survey returned using two mailouts plus reminder / thank you	\$18.69
Additional cost of phone call (C)	
Human resource cost of obtaining phone numbers and conducting calls	\$2,700
Reply paid for surveys returned	\$134
Postage resend 125 surveys	\$125
Reply paid mail for surveys returned	\$64
Total cost of C	\$3,023
Number of completed surveys after phone call (C)	62
Cost per completed survey returned using two mailouts plus reminder / thank you plus phone call	\$48.76

Notes: a) Some human resource costs were estimated, however these costs applied to all three levels of follow-up and therefore do not influence the relative costs. mailed to participants who agreed to complete the survey but did not have a copy (44 were returned).

The response rate for each age group ranged from 6% of the 18-22 year olds to 13% of the 33-37 year olds and was similar for males and females. Those who received a phone call were statistically significantly (p<0.0001) more likely to return a completed survey (n=62, 10.1%) compared to controls (n=1; 0.002%). The returned survey for the control group was a male aged 18-22 years. One survey was received from the 28 respondents who reported they had already returned it.

#### Survey development and implementation costs

The costs of the survey development and implementation are presented in Table 2.

The cost per completed survey returned after one mailout and a reminder/thank-you letter was estimated at \$24.85 (\$58,673/2,361 responses). The cost per additional completed survey returned after the second mailout was \$18.69 (\$11,101/594 responses). The cost per additional completed survey returned after the phone call follow-up was \$48.76 (\$3,023/62 responses) If all of the 125 surveys sent out after the phone call had been returned, the additional cost per completed survey would have been reduced to \$24.18 (\$3,023/125 responses) (Table 2).

The cost per survey of two mailouts plus a reminder/thank-you letter was reduced from \$24.85 (for one mailout plus a reminder/ thank you) to \$23.61. The addition of a phone call increases the cost per survey returned to \$24.13 (base component, Table 3).

#### Scenario analysis

The results of the scenario analysis are presented in Table 3.

Increasing the number of surveys returned by 10% and 20% at each level of contact decreased the cost per survey returned. For one mailout and a thank-you reminder, the cost decreased from \$24.85 to \$22.59 (for a 10% increase in response) and \$20.71 (for a 20% increase). For two mailouts, the cost per survey decreased from \$18.69 to \$16.99 and \$15.57 (for a 10% and 20% increase in response, respectively), and for the additional follow-up phone call, the cost per survey decreased from \$48.76 to \$44.33 (for a 10% increase in response) and \$40.63 (for a 20% increase).

Increasing the initial response rate by 10% and conducting a second mail survey reduced the cost from \$22.59 to \$21.87, which is a greater marginal cost saving than increasing the response rate from the second mailout by 10% (\$23.15) or increasing the response rate of the follow-up phone call by 10% (\$24.08).

## Discussion

Ten per cent of non-responders who received a follow-up phone call completed the survey. The benefits of conducting follow-up phone calls were not justified by the resources required and, as shown in the scenario analyses, are unlikely to be justified even with improved response rates. This study found one mailout and a reminder/thank-you letter costs \$24.85 per survey returned and achieves a response rate of 30.3%. An additional mailout,

with an estimated cost of \$18.69 per survey returned, increased the response rate to 38.5%. It was estimated that the cost of the follow-up phone call was \$48.76 per completed survey returned, increasing the response rate to 39.8%. This suggests that after having sent a reminder and an additional survey, it is not worth the resources (effectively doubling the cost per survey completed for the initial mailout) to obtain an increase in the response rate of less than 2%.

Consistent with previous research,<sup>5</sup> telephone numbers were obtained for 56% of the postal survey sample by searching the electronic version of the Australian telephone directory. When contacted (within five attempts), 65% with an available phone number agreed to continue with the call. Extending follow-up phone calls to the entire sample would further reduce the cost-effectiveness of the follow-up phone call strategy, assuming no substantial improvement in the number of returned surveys.

The data from this study, including the scenario analysis, quantify the costs and benefits of common strategies aimed at optimising health survey response rates. The most cost-effective strategy is to maximise the initial response rate, using the strategies identified in the existing meta-analytic review.<sup>1</sup> In the context of the current study, the ethics committee disallowed an incentive to optimise the initial response rate. Optimising response rates improves the methodological rigour of survey data and greater acceptance from ethics committees on the evidence for the effectiveness<sup>1,5</sup> and cost effectiveness<sup>11</sup> of incentives, is critical.

One strategy for increasing the cost-effectiveness of followup phone calls may be to target specific groups. The decision to conduct follow-up phone calls may be based, for example, on the need to increase responses from a specific age group. In this study, younger age groups were targeted with follow-up phone calls because their response rates to the initial and second mailout surveys were lowest. As shown in these analyses, however, even limiting to defined sub-groups imposes a substantial cost: \$3,023 for an additional 62 surveys (\$48.76 per survey). Consequently,

#### Table 3: Scenario analysis of costs.

the likely advantages of minimally increasing response rates for specific age groups need to be carefully weighed against the additional cost.

The current study also helps quantify the likely extent of the social desirability effect in phone calls in community-based surveys. Although 28 potential respondents indicated they had already returned the survey, only one survey was received and it is unlikely that the remainder were lost in the post. In addition, although 194 potential respondents continued with the call and indicated they would complete and return the survey, only 61 did so. This indicates that, despite responding positively on the phone, the majority of potential survey participants will not return the survey.

#### Potential limitations

This study has a number of potential limitations in assessing the effectiveness and costs of follow-up phone calls in improving survey response rates. First, it is possible that potential participants aged older than 18-37 years may have been more likely to have a telephone number and, given their initial response was greater, may also be more likely to complete and return a survey after a follow-up phone call. The increased return rate would have to be substantial given the scenario analyses showed a 20% increase was not cost-effective. In addition, specifically in the context of an alcohol harm survey, increasing the response rate among those who contribute relatively less to alcohol-related harm provides little benefit. Second, the 56% of all eligible participants for whom a phone number was identified using Australia's White Pages Online are unlikely to be representative of all those who failed to respond to the mailed survey. In this study, those with telephone numbers were not significantly different to those without telephone numbers in terms of age and gender, although they may differ on other characteristics. Alternative methods, such as paper-based telephone directories, are unlikely to identify a substantially greater proportion of telephone numbers. Third, although possibly

	Mail out + reminder/ thank you	Second mail out	Two mail outs + reminder/ thank you	Phone call	Two mail outs + reminder/thank you + phone call
Base component	А	В	A+B	С	A+B+C
Cost of survey	\$58,673	\$11,101	\$69,774	\$3023	\$72,797
Number of surveys returned	2,361	594	2,955	62	3,017
Cost per completed survey	\$24.85	\$18.69	\$23.61	\$48.76	\$24.13
Increasing initial response rate by 10%	A +10%	В	(A+10%) +B	С	(A+10%) +B +C
Cost of survey	\$58,673	\$11,101	\$69,774	\$3,023	\$72,797
Number of surveys returned	2,597	594	3,191	62	3,253
Cost per completed survey	\$22.59	\$18.69	\$21.87	\$48.76	\$22.38
Increasing second mail out response rate by 10%	A	B+10%	A+(B+10%)	С	A+(B+10%) +C
Cost of survey	\$58,673	\$11,101	\$69,774	\$3,023	\$72,797
Number of surveys returned	2,361	653	3,014	62	3,076
Cost per completed survey	\$24.85	\$16.99	\$23.15	\$48.76	\$23.66
Increasing phone call response rate by 10%	А	В	A+B	C+10%	A+B+(C+10%)
Cost of survey	\$58,673	\$11,101	\$69,774	\$3,023	\$72,797
Number of surveys returned	2,361	594	2,955	68	3,023
Cost per completed survey	\$24.85	\$18.69	\$23.61	\$48.76	\$24.08

more cost-effective, obtaining contact details other than telephone numbers, such as e-mail, is not practical for a community sample. Fourth, phone calls may be more cost-effective for surveys that involve less-sensitive topics, given evidence of higher response rates for surveys containing less-sensitive questions.<sup>1</sup>

# Conclusion

This study shows follow-up phone calls statistically significantly increase the number of responses to a community-wide survey, relative to no such phone call. This relative increase in responses, however, was insufficient to justify their costs in terms of the absolute impact on the response rate. Scenario analyses show increasing the initial response rate by 10% and conducting a second mailed survey achieves greater marginal cost savings than increasing the response rate to the second mailout or the followup phone calls. Researchers may usefully identify a specific cost per response they are able to absorb, since the overall cost per survey returned will be the major factor guiding decisions on which strategies to adopt to optimise their survey response rate.

Results from this study suggest follow-up phone calls, after an additional survey has been sent to non-responders, is unlikely to be a cost-effective strategy for increasing community survey response rates, even when targeting specific sub-sets of respondents who are under-represented. Efforts to optimise the initial response rate and the provision of a second mailed survey to those who do not respond are cost-effective, especially given the substantial development and implementation costs of community surveys.

## Ethics and acknowledgments

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## References

- Edwards P, Roberts I, Clarke M, DiGuiseppi C, Pratap S, Wentz R, et al. Methods to influence response to postal questionnaires (Cochrane Review). In: *The Cochrane Database of Systematic Reviews*, Issue 2, 2007. Chichester (UK): John Wiley & Sons; 2007.
- Salim Silva M, Smith W, Bammer G. Telephone reminders are a cost effective way to improve responses in postal health surveys. *J Epidemiol Community Health.* 2002;56(2):115-8.
- Saunders J, Aasland O, Babor T, De La Fuente J, Grant M. Development of the Alcohol Use Disorders Test (AUDIT): WHO Collaborative project on the early detection of persons with harmful alcohol consumption II. *Addiction*. 1993;88:791-804.
- Dolan P, Gudex C, Kind P, WIlliams A. A Social Tariff for EuroQol: Results from a UK general Population Survey. Working Papers No. 138. York (UK): Centre for Health Economics, University of York; 1995.
- Kalantar J, Talley N. The effects of lottery incentive and length of questionnaire on health survey response rates: A randomised study. *J Clin Epidemiol*. 1999;52(11):1117-22.
- Kaplowitz M, Hadlock T, Levine R. A comparison of web and mail survey response rates. *Public Opinion Quarterly*. 2004;68(1):94-101.
- Shakeshaft A, Bowman J, Sanson-Fisher R. Community-based drug and alcohol counselling: who attends and why? *Drug Alcohol Rev.* 2002;21:153-62.
- Petrie D, Doran C, Shakeshaft A, Sanson-Fisher R. The relationship between alcohol consumption and self reported health status using the EQ5D. Soc Sci Med. 2008;67:1717-26.
- Stockwell T, Heale P, Chikritzhs T, Dietze P, Catalano P. How much alcohol is drunk in Australia in excess of the new Australian alcohol guidelines? *Med J Aust.* 2002;176(2):91.
- The American Association for Public Opinion Research. Standard Definitions: Final Dispositions of Case Codes and Outcome Rates for Surveys. Ann Arbor (MI): AAPOR; 2008. p. 34-8.
- Hawley K, Cook J, Jensen-Doss A. Do noncontingent incentives increase survey response rates among mental health providers? A randomized trial comparison. *Admin Policy Ment Health*. 2009;36:343-8.