Response Rate, Incentives and Timing of Online Surveys: A study of Agriculture Researchers in Kenya

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Abstract

With the increase in internet connectivity, web-based surveys will increasingly be used as a tool for data collection characterized by low financial resource implication, quick response time, and no need for separate data entry. This study had the objective of learning how different survey window lengths and incentives affect responses to online surveys. The study was carried out in the context of an online conjoint survey involving the ranking of different domestic biogas plant attributes presented to 345 respondents from the Kenya Agricultural and Livestock Research Organization (KALRO). Email invitations to the survey were sent in three waves spaced one week apart. The respondents were assigned to 4 blocks composed of an incentive in the form of a lottery of either (zero, $50, $100, or $150) for having completed the survey. Within these groups, a timing (one, two, or three weeks) by which the survey would be opened to receive responses was included as an additional treatment. With a response rate of 11.8 percent, neither the incentive nor the time to respond had an impact ($p<0.05$) on the decision to respond. Sixty-five percent of those responses were received within the window indicated in the email invitation. The distribution-free Kruskal-Wallis H test revealed no jointly significant association between the response speed and the incentive nor the time granted treatments. Similar results are obtained through the non-parametric equivalent of the ANOVA (Jonckheere-Terpstra trend test) which reveals that neither of the treatments separately or jointly influenced response speed. However, longer deadlines may induce some response. Results also show an effect suspected to be that of a reminder.

Keywords: responses, incentive, time to delivery, online survey

Introduction

Getting good responses from online surveys has become more difficult over time. Concerns have been raised about the representativeness of responses due to low response rates. Characterized by low financial resource implication, online surveys have a quick response time, and usually don't require separate data entry efforts (Cobanoglu and Cobanoglu, 2003; Ilieva *et al.,* 2002). Many authors have reported low response rates in online (or web-based) surveys. What researchers can do to cajole potential respondents increase response rates is an ongoing discussion.

In the last few decades, the internet has become pervasive and so have web-based surveys. This suggests that online surveys will continue to be used as a tool for data collection (Lindhjem and Navrud, 2011). However, low response bias can damage the reliability and validity of survey study findings (Fincham, 2008). Some reports however suggest that in Sub-Saharan Africa (SSA), the low penetration of the internet or phones coupled with low literacy rates are still challenges for data collection (Hughes and Lin, 2018). However, for the special populations that regularly use the internet in their daily lives, the new medium is suggested as a sensible means of achieving meaningful results (Sills and Song, 2002).

Survey response rates depend on a combination of factors including reward, trust, and costs (Saleh and Bista, 2017). Response rates have been low for online surveys in

several countries and it is feared that these could be going down (Sheehan, 2001). For instance, in 8 studies reporting response rates from online surveys, response rates hardly go beyond 40% (Nulty, 2008). It is reported that web-surveys yield response rates that are 11% lower than other modes (Lozar Manfreda *et al,* 2008) This low response could be due in part to undelivered emails, or if delivered, they are overlooked or even treated as spam (Vehovar and Lozar Manfreda, 2008; Fan and Yan, 2010). Some authors have suggested that incentives could help mitigate some of these problems. In addition, offering a menu of different response modes sequentially web offered as the first can increase response rates (Millar and Dillman, 2011).

An examination of some of the characteristics that can improve response rates to electronic surveys suggests that the odds of response increase by more than a half if short questionnaires are used, after promises of non-monetary incentives are given or including a statement that others had responded (Edwards *et al.,* 2009). Odds increased by a third when respondents were promised a lottery with immediate notification of results, using a white background as well as providing a deadline (ibid). The organization the sponsoring research too has a bearing on response rates with government and educational institutions performing better than commercial sponsors (Fan and Yan, 2010). Incentives may work through the norm of reciprocity if prepaid incentives are offered (Koskey *et al.,* 2015; Porter and Whitcomb, 2003). Such incentives also work through the principle of economic exchange where respondents participate in exchange for specific monetary compensation (Porter and Whitcomb, 2003). However, post-paid incentives from both of these psychological and economic points of view should have little or no impact on response rates (Porter and Whitcomb, 2003). Some authors suggest that offering incentives does not increase response rates (Cook *et al.*, 2016; Wilson *et al.,* 2010).

Other authors report a significant though minor incentive effect (Göritz, 2004; Vehovar and Lozar Manfreda, 2008; Millar and Dillman, 2011). Yu *et al.,* (2017) in the US reported that a $10 incentive was useful in encouraging initially reluctant participants to respond to a survey request, increasing response rates by 18%. Porter and Whitcomb (2003) suggested that there was a need for a larger-sized incentive.

These two varying positions suggest that there might be some conflicting evidence concerning incentives and their role in improving response rates. Besides, many of the studies have been conducted in developed economies where internet penetration is arguably higher than in SSA. In addition, the reported existence of publication bias the "file drawer" problem where publication of findings depends on the significance and direction of results suggests that null results have a high probability of failing to be documented (Franco *et al.,* 2014). In addition, studies investigating these issues are limited and the populations and research topics they use are different, thus researchers do not have a clear idea of the effects of the internet-based surveys (Cobanoglu and Cobanoglu, 2003).

Under such circumstances, it is no longer very clear where the true distribution lies, although, from available literature, it is clear that reminders and pre-paid incentives do work to increase response rates. Besides, work on such incentives in a Kenyan context is hard to come by. Moreover, other authors contend that when payments are the driving force for staying in online panels, the motivation for providing optimal answers needs to be questioned (Stern *et al,* 2014). Given the difficulty in providing pre-paid incentives in the context of web surveys, the current study investigated the effect of using sizable post-paid incentives and different response durations on response rates in a Kenyan context. The effect of an ad-hoc reminder introduced due to the nature of the study is also reported.

Materials and methods

A questionnaire was developed using a survey administration app (GoogleForms) and invitees were notified through email with a link to the questionnaire. The questionnaire comprised six multiple-choice questions and 12 choices to rate on a linear scale presented as choice buttons. The theme of the research was a pilot conjoint study of domestic biogas

plants which was the subject of a separate paper[5]. The present study was part of the socioeconomics work package nested within the larger research project *"Optimizing small-scale biogas technology for household energy and improvement of soil fertility within coffee-dairy production systems in Kiambu and Machakos Counties"*. Given the logistical and financial challenges experienced, however, an online mode of survey execution during the pilot was found to be the most viable option. This study was therefore organized following the procedure outlined below.

A total of 1,112 email addresses were harvested from various internal sources and duplicates were dropped. This yielded 420 unique email addresses of Kenya Agricultural and Livestock Research Organization (KALRO) scientists. They were all randomly assigned into four groups offered zero, $50, $100, or $150 as a token of appreciation for having completed the survey. This token would be redeemed through a raffle conducted at the end of the study. This meant that at the beginning of the study, respondents were not able to know the associated probabilities of entering the raffle. Moreover, the emails were sent under the blind carbon copy (bcc) field, ensuring that none of the recipients would tell how many others had received a similar invitation. In essence, participants were randomly allocated to groups with either "no knowledge of" or "knowledge of" a financial incentive to be provided on completion of the survey, and those with "knowledge of" couldn't easily calculate their probabilities of winning. Each of these groups was further split into three groupings which represented different survey durations: one week, two weeks, or three weeks long. From the 420 email addresses, three hundred and forty-five (345) received an invitation from a web-based email as several emails (17.8%) did not go through (Table 1). A test for independence showed that the rows and columns in Table 1 were independent. This was true both for those *invited* $\chi^2_{(6)} = 1.846, p = 0.933$ and those who *received* the invitation $\chi^2_{(6)} = 1.4651, p = 0.962$

This implied that the allocation of email addresses (individuals) to groups was even and the failure of the 17.8% to receive the invitation did not alter this allocation in any significant way.

Table 1: Email invitations and allocation to treatments

Time given	No. invited					No. receiving the invitation				
	Incentive size					Incentive size				
	$0	**$50**	**$100**	**$150**	**Total**	**$0**	**$50**	**$100**	**$150**	**Total**
1 week	35	35	34	35	**139**	26	23	27	30	**106**
2 weeks	35	35	35	35	**140**	32	30	31	28	**121**
3 weeks	35	35	36	35	**141**	35	27	30	26	**118**
Total	**105**	**105**	**105**	**105**	**420**	**93**	**80**	**88**	**84**	**345**

The emails were sent out in three waves spaced one week apart, all randomly allocated to the email addresses. The first wave of invitations was sent on 5/11/2018 and the last on 19/11/2018 and the responses were received until 15/12/2018. The study window was originally planned to last for five calendar weeks (last responses expected by 9/12/2018) but was instead extended to last for a total of 41 days. This window length was chosen because responses to email surveys can be expected within one month, having a turnaround time of 5.5 days and experts recommend that online surveys run for at least one week (Ilieva *et al,* 2002). The motivation for this extension was a glitch in the KALRO mail server which happened at the beginning of the study. The research team was not aware of this problem until much later into the study, hence the extension of the original time window. This breakdown altered an element of the context under which the respondents made their responses known. While KALRO scientists

5 See Mailu et al., (2019) for more details of about the study in which the present paper is embedded.

enjoy "free" internet service in their offices, the breakdown meant that some respondents may have been "forced" to incur the cost of internet service while completing the survey. For each of the recipients, the email text gave a terminal date when the survey would be closed, all depending on the date the email invitation was sent and the three *"time given"* groupings that the recipient had been randomly placed.

In the invitation, respondents were requested to perform a ranking exercise on different domestic biogas plant attributes presented as a set of combinations of characteristics. There were 12 sets in total for each respondent labelled A to L. An example of such exercise is shown in Figure 1. The invitation also included an official letter from the project principal investigator (PI) which included details about the project and the reasons for the invitation. The email body contained introductory information about the project and its financier including a link to the project website, contact information for project organizers, and an assurance that responses would not be shared with third parties. A URL linked the respondent to the survey tool. These design principles suggested by Michaelidou and Dibb, (2006) have also been applied by other researchers (see for example Wilson *et al.,* 2010) The email included a timing within which the survey would be open to receive responses with three options either one, two or three weeks as indicated in Table 1. The survey tool itself consisted of a welcome screen where respondents would register, a second page which provided all necessary details about the exercise contained in the remaining seven pages.

The body of the email text included a statement "As a thank you gesture, you have the opportunity to be entered into a draw to win $ X" where X represents either 50, 100, or 150. In the fourth block (incentive size=$0), this particular statement was omitted. The objective was to learn how different survey window lengths and incentives affect response time. A reminder email was sent on day 20 post-initial invitation for each of the respondents to increase participation. Participants were not made aware of the hidden experiment when completing the questionnaire. The date each of the responses was made was recorded and each receipt was labelled as being in-time or late. All responses were acknowledged with a simple *"thank you"* email reply. The promised raffle was conducted by randomly selecting six winners from among those that had sent in their responses. All six winners: one winning $150, two winning $100, and 3 winning $50 were subsequently contacted and the winnings as promised, were paid through their respective M-PESA accounts[6].

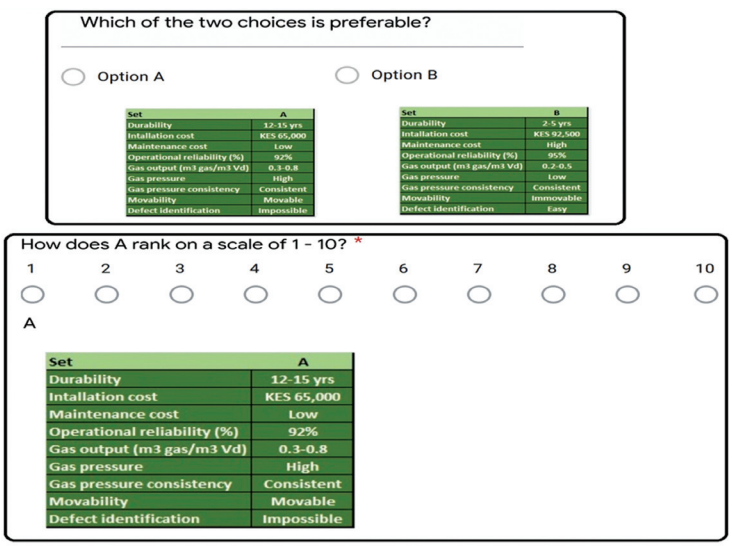

Figure 1: Example of choice tasks that researchers were invited to undertake

6 In December, the exchange rate was 1$ to Ksh 101.80

Results

Response rates

Since delivery is not a sufficient condition for the email being read by the recipient, we had no way of knowing whether the whole set (345) of those invited read the email invitation. The distribution of the responses shown in Table 2 was even across the groupings. A series of the two-sample test for proportions confirms that the proportion of respondents in the treatments (incentives and timings) was not significantly different within the treatment groups (p>0.05). Similar conclusion can be made from the chi-square test $\chi^2_{(6)} = 3.75, p = 0.710$ for those who responded (all) and $\chi^2_{(6)} = 4.115, p = 0.661$ for those responding in time (in-time).

The non-parametric Kaplan-Meier survival function derived from the data was much steeper for wave 3. From the shape of the survival curve in Figure 2, it is clear that more from wave 3 were able to respond before the deadline compared to those in waves 2 and 3. The effect of the deadline is also discernible as a slight elbow around the respective days 7, 14, and 21 days post invitation.

Table 2: Treatments and allocation in the study and responses received

	No. responding (all)					No. responding (in-time)				
	Incentive size					Incentive size				
	$0	**$50**	**$100**	**$150**	**Total**	**$0**	**$50**	**$100**	**$150**	**Total**
1 week	3	5	6	4	18	1	3	5	4	13
2 weeks	5	7	3	4	19	3	5	2	2	12
3 weeks	9	5	7	5	26	4	5	3	4	16
Total	**17**	**17**	**16**	**13**	**63**	**8**	**13**	**10**	**10**	**41**

The total number of responses received by the end of the study was 63, with a proportion of these coming in after the indicated deadline (Table 2). A significantly (p=0.0083) greater proportion (41 responses) representing 65 percent of responses were received within the stated date with the remainder coming in well past the deadline (Table 2). Since each of the questions was to be attempted and had forced responses (no item non-response), there may have been situations where respondents refused participation altogether or terminated participation before completing the survey. We did not have a means of checking how many uncompleted attempts had been made.

The proportion of early responders was not different across groups defined by the promised lottery or time granted to complete the survey (p>0.05). However, since the survey invitations were sent in 3 waves (1 week apart), it emerged that the proportion of early responders from the first and second waves were not different though there was a marked difference between the proportion of responses from the third wave[7] . Significantly more respondents (86%) made it before the deadline during the third wave compared to those in the first (50%) and second (53%) waves than would be expected by chance (exact binomial p<0.05). This could be a result of internet access difficulties that respondents may have experienced when the KALRO server was down for some time and was not rectified until later in the study.

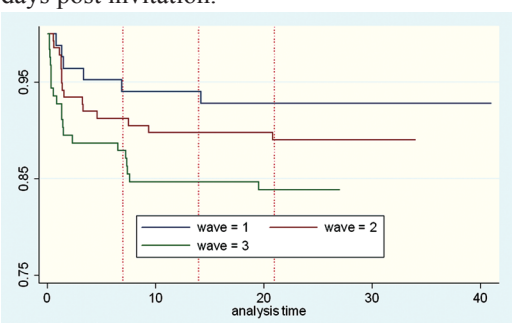

Figure 2: Kalpan-Meir survival curves for different waves for the entire sample of responders

Reminders sent out to all respondents on the 20th day post-initial invitation (24/11/2018)

7 Coincidentally, the KALRO server had blown out on the week when the study commenced and many emails sent through the KALRO mail server bounced. This outage was not rectified until deep into the study.

increased the response rate to a total of 63 (or 18.2%) from 41 responses (11.8 percent). The effect of this action is visible in Figure 3 where for all three waves at day 21 post-invitation, the curve appears to have a slight bump, reflecting this fact. Each line begins on the date when each of the email waves was initiated, hence the staggered origins on the horizontal axis.

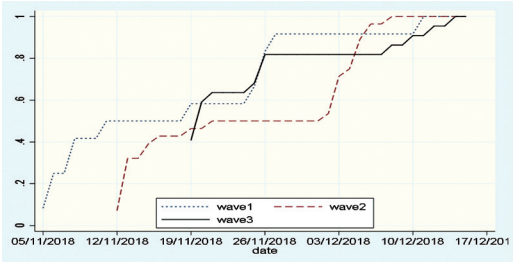

Figure 3: Plot of response proportion by date for respective waves of email messages

Impact of treatments on responses

We run a logistic regression where we estimate the probability of an email recipient responding (RESPOND=1) and responding in time (RESPONDINTIME=1), modelled as a function of the incentive size and the amount of time given to respond;

$$\log \frac{p_i}{1+p_i} = \alpha_0 + \sum_{j=1}^{k} \beta_j \chi_{ij} + \varepsilon_i \quad \text{.....(1)}$$

Where the subscript j is the response category out of k categories, i denotes individual participants (i=1,2…,345), p_i is the conditional probability, α_0 is a constant term, β_j is the coefficient of the independent variable, χ_{ij} is a matrix of observed values (incentive size and number of days given to complete exercise) while ε_i is a matrix of the unobserved random effect. A specification test reveals no specification error. A likelihood ratio test led to the conclusion that the treatments do not provide evidence of altering the decision to respond to the survey request $\chi^2_{(1,3)} = 1.07, p = 0.5860$ (i.e. no improvement to the null model compared to one augmented with these treatments). For the responses received before the deadline, results from the logistic regression similarly suggest that there was no significant association between responding before the deadline and time granted or the incentive effect $\chi^2_{(1,3)} = 1.27, p = 0.5312$. To account for the small sample size (n=63), an exact logistic regression was performed. It yielded p-values in fair agreement with the standard maximum likelihood logistic regression estimates, leading to a similar conclusion.

Response timing

Most (56%) of the responses were received during the time between 6 am and 12 pm on Monday or Tuesday (67%). Since most of the emails were sent on Sunday evening (including reminders) when most people were likely out of their office, it is conceivable that come Monday morning, they were able to respond to the email messages and take the time to respond to the survey. This result gives us a sense of the environment under which these responses may have been made (Fig. 4). This tapering response is in agreement with what other researchers have reported, that more responses are expected within the first few days (Lindorf and Wygant, 1999).

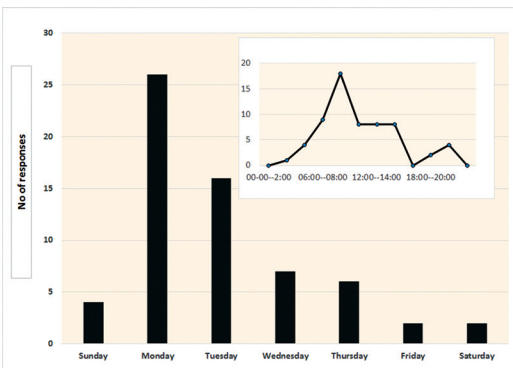

Figure 4: Day of week and time (inset) when respondents filled in and returned the questionnaire

Most responses came in within the first few days after the invitation or reminder (Fig. 5). For wave 3, at least 40 percent of responses came on the first day compared to waves 1 and 2 where a smaller proportion, (about 15 percent) responded on the same day that emails were dispatched. The influence of internet connectivity is probably the reason for this

pattern. The steep rise in response frequency just a few days after receipt of the emails followed by a plateau lasting until a reminder is sent probably implies that without the reminder, the proportion of responses would remain the same after this initial burst of responses, despite the amount of time elapsed. Reminders were sent out on 24/11/2018 to all respondents. The reminder effect is discernible in Figure 5B where on day 21, and for a few days thereafter, there is a clear jump in response on each of the separate series.

Response by the indicated date

The expected effect of deadlines is shown in Figure 5. This graph suggests that at any given moment, longer deadlines may lead to some procrastination tendencies (i.e. proportion of responses for shorter deadlines lies above that of longer deadlines). However, this is not certain for 1-week and 2-week deadlines where Figure 5A shows these lines intersecting, and therefore no clear demarcation. This could be an effect of the delayed delivery of emails at the beginning of the study following the server failure incident. Generally, however, the results suggest that such externally imposed shorter deadlines may be effective in improving task performance (Ariely and Wertenbroch, 2002).

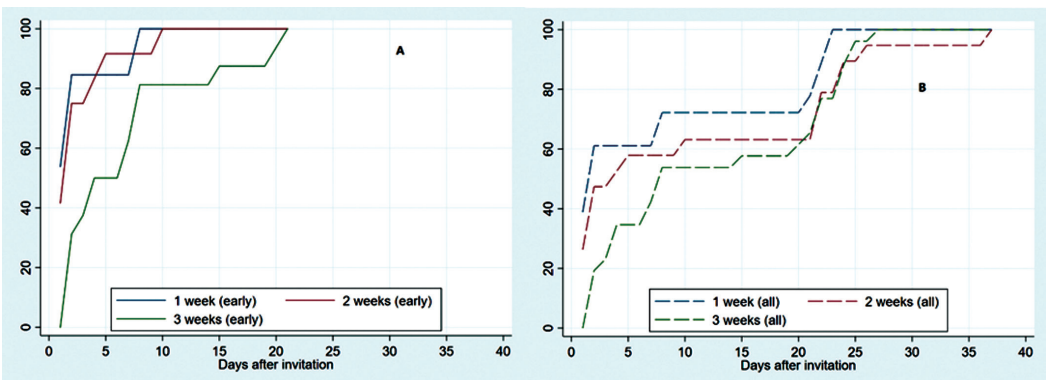

Figure 5: Early responders (a) and all respondents (b) by day from the initial email request

Turnaround time for early responders

The distributional shape of time taken to respond was visually examined to determine the extent to which the normality assumption was met. The Shapiro-Wilk test of normality suggests that normality was not a reasonable assumption with the variable the amount of time taken to respond W=0.807,p<0.01. A test confirms that the distribution of scores for each group (incentive and time) have the same shape save for the pairs (week 1 and week 3) and (week 2 and week 3). Under this circumstance, therefore, we can only use the Kruskal-Wallis H test to compare mean ranks rather than medians of the independent variable - days to response. A Kruskal-Wallis H test was conducted to determine if the mean rank of time taken to respond to the emails was different for the four incentive groups 0$,(n=8), 50$,(n=13), 100$,(n=10), and 150$,(n=10). The test showed that there was no statistically significant difference in the mean rank of time taken by the four groups, $\left[\chi^2_{(3)} = 1.125, p = 0.771\right]$. The Kruskal-Wallis H test run on the three study timelines 1 week,(n=13), 2 weeks,(n=12), and 3 weeks,(n=16) confirmed that externally imposed timelines may be important in influencing actual turnaround time $\left(\chi^2_{(2)} = 10.99, p = 0.0041\right)$.

A non-parametric test for ordered differences [A Jonckheere-Terpstra (T_{JT})] test for ordered alternatives showed that there was no statistically significant trend of higher median response time with larger incentives (from "$zero", "$50", "$100" to "$150" incentive levels) J*=-0.210,p(Z<J*)=0.5832. However, there was a statistically significant trend of higher median response time with longer deadlines ("one", "two" and "three" weeks) J*=3.046,p(Z<J*)=0.0012 indicating a preference for longer deadlines. The median response time (by increasing deadline length)

was 0.8, 1.2, and 4.9 days respectively. The overall median time to respond was 1.4 days. This response time is in agreement with Lindorf and Wygant, (1999) who report that 80% of online surveys are returned within two days. The median (by increasing incentive size) was 1.3, 1.5, 1.4, and 1.4 days respectively.

It was noted that the treatments were offered not in isolation but were combined in the invitation. Given the text of the email invitation, respondents were assumed to jointly consider both the timing and the incentive size when deciding to respond. Therefore, the treatments are in effect 12 as represented in the cells of Table 1. We further assumed that an incentive is preferable to none and that a larger incentive is preferable to a smaller one. Therefore, according to the axiom of transitivity, the following holds ($0<$50<$100<$150). Likewise, more time granted to complete a survey is more preferable to less (wk3>wk2>wk1). We, therefore, combine the treatments as shown on the horizontal axis of Fig. 6. We assumed a constant rate of substitution between incentives ($) and time (wk) although we are unable to formally test this arbitrary assumption.

Jonckheere-Terpstra test showed that there was no statistically significant trend of higher median response time with larger incentives (from "$zero", "$50", "$100" to "$150" incentive levels) in combination with different deadlines (“one”, “two” and “three” weeks) J*=0.599,p(Z<J*)=0.2747. This result reveals no evidence of a trend of higher median response time for groupings ordered by their presumed attractiveness Fig. 6.

Reminders

To test for the influence of a reminder, we reconstruct the data and ran an interrupted time series regression with interruption modelled at day 20 when the reminder was sent. As would be expected, if the reminder has no effect, then no jumps should be noticed in the cumulative receipt of responses. The initial mean difference between the 3-week group (estimated as -0.34) and the rest was significant (p<0.05,95%CI: -0.45,-0.22) but the difference in the mean baseline slope was not (p=0.26,95%CI: -0.01,0.06) implying that cumulative responses were different initially until the reminder on day 20. The 3-week group’s cumulative responses

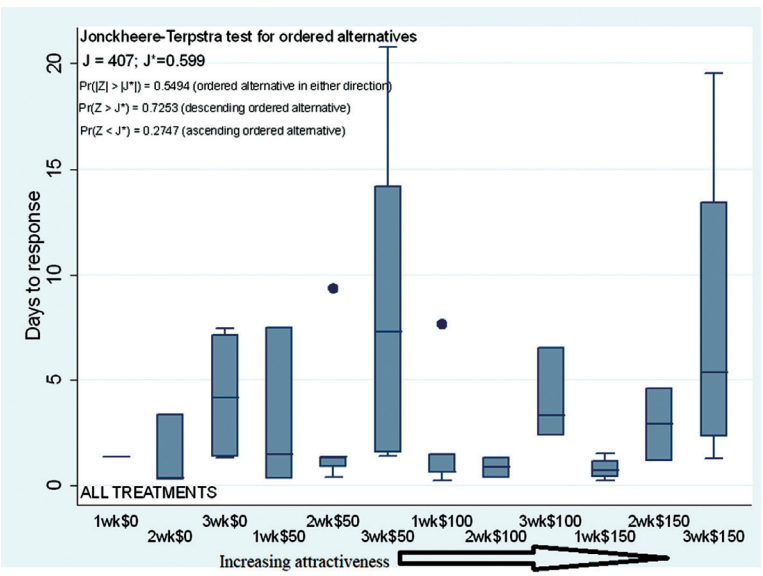

Figure 6: Box plots of response time versus attractiveness for early responders

After establishing that the distributions of these 12 groups were identical, we proceeded to perform a nonparametric test for ordered differences among classes. The were below the other groups (Fig. 7) but a reminder worked to induce a jump in responses for this particular group. The estimated effect is a significant (p=0.004,95%CI: 0.008,0.04)

cumulative percent increase of 0.026 for the 3-week group, but not so for the group of 1 and 2-week response duration which was not significant ($p>0.05$). Here we need to point out that by the time the reminder was sent out, there were many respondents whose deadlines had already elapsed. However, even for those invited in the first wave, the deadliness for all 3-week group respondents had not expired. Though we could not distinguish between the effects of the deadline on the 21st day from the effect of the reminder on the 20th day, it seems plausible that much of this effect on the 3-week group is from the reminder given the magnitude of the differences observed at day 7 and 14 post-invitation.

Comparing wave three to wave two and one response rates suggested that without internet access, response rates may have been depressed by the difference (86%-50%=36%). Similarly, the survey topic (biogas attribute ranking) may also have contributed to this low response because not all KALRO scientists work on or have an interest in the subject of biogas. Further, prior notifications, which Daikeler *et al.,* (2019) suggest could improve response rates were not provided in this study. These are among some of the reasons why we think the response rate was low.

While post-paid incentives in the range of $5-$50 do not have a strong effect on response rates Porter and Whitcomb, (2003), the size of

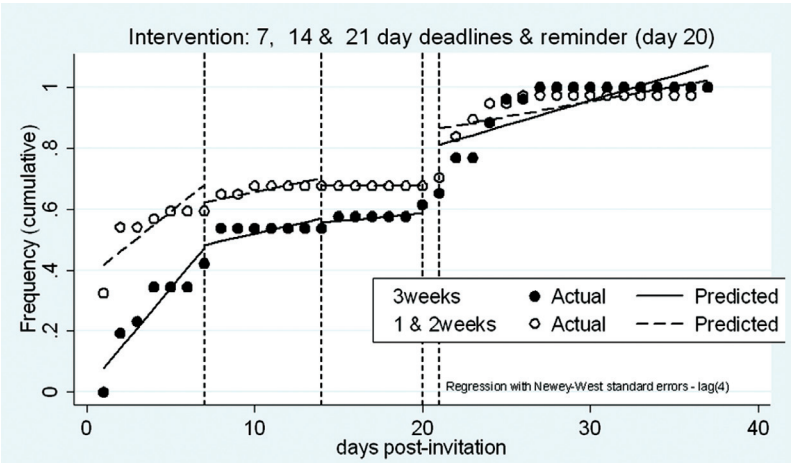

Figure 7: Multiple-group interrupted time series analysis with Newey-West standard errors and four lags

Discussion

A response rate of 11.8% was achieved in this study. There are currently few studies undertaken among a comparable study population. Notably, however, this response rate is lower than the response rates among university populations reported by Nulty (2008). It is not entirely clear whether the time of the year when the survey was done was a busier period for KALRO researchers. Interrupted internet connectivity might have played a role in the response observed in this study. The unplanned server failure serves as a ground to estimate (indirectly) the effect of "free" internet access. Wave 3 emails were sent at a time when the server problems had been rectified. the incentive in the present study ($50-$150) was considered generous for an estimated 10-15 minute session in front of the computer. However, this was not a guaranteed incentive, but one subject to chance (lottery). The survey respondents in this study were not actively provided with any prior information about the objective probabilities and therefore the expected value of the lottery. It is possible that in its place, they applied subjective probabilities in the evaluation of the lottery's expected value. As professional researchers, coming up with a range of probable sample sizes is a trivial problem. These, they can use to come up with a forecast of their odds. Another related argument we could put across is that there is a possibility

that the incentive sizes were not as generous as initially thought. A generous incentive is relative! Taken together, low expected odds of winning may have worked to lower the desired impact of the incentive on response rate.

Researchers have suggested that a completion time of 13 minutes or less is ideal to obtain a reasonable response rate (Fan and Yan, 2010). To provide an idea about the amount of work that respondents were expected to undertake, the present study requested responses to six multiple-choice questions and 12 profiles to rate: a total of 18 decisions (Mailu *et al.,* 2019). From comparable choice experiments, this represents a modest task. Considering no more than a minute for each question, this translates to no more than 18 minutes spent while undertaking the survey.

More fundamentally, this study suggests that neither incentives nor longer deadlines affect the probability of responding to an online survey request. This is in line with the findings reported by Porter and Whitcomb, (2003) and Wilson *et al,* (2010) as well as the review by Daikeler *et al.,* (2019). Nor did the financial incentive in combination with generous deadlines seem to alter response time. Longer deadlines on their own do appear to influence response time. These results are in contrast to a meta-analysis that suggested that incentives were significant predictors of response rates (Asire, 2017). For instance, a panel respondent survey in the US revealed a 30 percent increase in the likelihood of response during a 3-month incentive experiment demonstrating the wisdom of offering a monetary incentive (Yu *et al.,* 2017). Among some Australian universities where academics were simply advised to ensure that they encourage the students to respond to online surveys, Nulty, (2008) reported that inspiring students alone appears to have little effect in boosting response rates. The argument is that without an incentive, respondents may tend to give up when bored, thereby reducing the response rates. On the other hand, lotteries (vouchers) offered in short (long) questionnaires were shown to be effective incentives to encourage responses (Deutskens *et al.,* 2004).

This current study showed that reminders may have been useful in stimulating the response within the set timelines. Such a practice is therefore recommended. However, since the effect of the reminder on day 20 is indistinguishable from the 3-week deadline, similar work may need to be done to disentangle this effect. Such study may also try to include practical issues such as personalizing survey implementation by using personalized messages as suggested by Monroe and Adams (2012). Relatively few studies seem to have looked at the influence of deadline length and actual responses.

Conclusion

An 11.8% response rate was achieved in the study. The results in this study do not show a distinct response from incentives. Nor is there a distinct response from providing more time. An effect of a reminder seems to be present. However, these results are not devoid of some weaknesses and should be interpreted with caution.

Whether all the invited respondents actually received the email invitation is not possible to determine. Further, sample size problems may not be ruled out. The effect of an unexpected interruption by the failed server cannot be ruled out. We also do not know the exact preference ordering of the combination of incentives and deadlines as assumed in this study. Given the study, it is difficult to distinguish with certainty the effect of a reminder indeed from the deadline at day 21 post invitation. Finally, the generation of the sample itself may not have been optimal since the list used was a complete listing of all KALRO researchers.

Given the foregoing, the authors suggest that further work of a similar nature may be necessary. A carefully implemented study that does not include an ad hoc treatment such as the reminder sent out on day 20 post invitation as done in this study would suffice. If a reminder is necessary, such should be sent out in a manner not likely to contaminate or be contaminated by effects of other treatments. Such a study can easily be embedded within online surveys which are increasingly becoming routine.

Acknowledgments

This work has been completed through

support from the National Research Fund (grant NRF/R/2016/045). Simon Mugi sent the emails which make up this study and we appreciate his help with this very repetitive task. Participants who took time off from their busy schedules to attend to our survey are greatly appreciated. All remaining errors are those of the authors.

Ethical statement

All participants voluntarily opted for the study. Their anonymity is preserved by assigning respondents a random numerical code with which to identify them in the data. No association has been made between their real names and the results as such personal data such as names, sex etcetera was not collected.

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