



Australian Government
The Treasury

Australian
Centre for
Evaluation

ace

Pre-analysis plan: Improving on-time submission rates for charities

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Summary table

Project title	Improving on-time submission rates for charity Annual Information Statements (AIS; financial year reporting cohort)
Partner	The Australian Charities and Not-for-profits Commission (ACNC)
Evaluator (Institution)	Australian Centre of Evaluation (ACE) and the ACNC
Principal investigator(s)	Vy Nguyen, Vera Newman, Tim Liu
Trial design (including number of arms)	Two-arm randomised controlled trial
Unit of randomisation	Individual charities
Stratification variables	Batch number that email is to be sent in
Target group	Charities regulated by the ACNC who have not yet submitted their AIS
Anticipated number of participants	Approximately 11,000
Primary outcome measure	Annual Information Statement (AIS) on-time submission
Secondary outcome measures	Time to submission following receipt of reminder email

Policy context

The Australian Charities and Not-for-profits Commission (ACNC) requires the approximately 55,000 registered charities across Australia to submit an Annual Information Statement (AIS) each year. The AIS is an important tool for maintaining sector transparency and accountability. This online form, covering operational and financial details, is submitted through the ACNC Charity Portal at no cost.

The AIS is due six months after a charity's reporting period ends. 65% of charities report information to the ACNC aligned with the standard financial year. For charities reporting by financial year, the AIS is due on 31 December, however, the Commissioner annually defers the due date to 31 January to accommodate the Christmas and New Year period.

The ACNC currently sends all reminder emails to a charity's 'address-for-service' (AFS). Despite existing reminder campaigns, including 2 reminders sent annually (2–3 months and 2–3 weeks before the due date), the ACNC struggles to achieve its target of 75% on-time submissions.

The ACNC's internal research indicates that common barriers to on-time submission include:

- incorrect address for service email address provided,
- portal access difficulties,
- ceased operations unknown to the ACNC,
- lack of time or understanding about the AIS's importance.

This project aims to test an approach to improve the effectiveness of the second email reminder, sent 2–3 weeks before the due date. The intervention includes an email sent to the AFS (business-as-usual) as well as to one of the charity's Responsible Persons (new email). The intervention will be targeted towards charities who have not yet submitted the AIS in response to the first reminder. The proposed research covers some of the barriers outlined above, most notably dot points 1 and 4.

The intent of this email is to increase on-time AIS submissions. The goal is to enhance sector oversight and ensure the Charity Register is accurate and up-to-date to support accountability and transparency.

Trial aim

This trial aims to test an approach to improve the effectiveness of the second email reminder, targeting charities who have not submitted the AIS in response to the first reminder. Specifically, the trial aims to test whether including a second email reminder, sent directly via email to a relevant Responsible Person (in addition to the AFS email), improves on-time AIS reporting.

Intervention Type: Two-arm randomised controlled trial

- Level of randomisation: individual charities
- Groups:
 - Control: Standard second reminder email sent to AFS only
 - Treatment: Standard second reminder email sent to AFS, and an additional reminder sent to a Responsible Person for the charity.

Determination of Responsible Person

The ACNC will use the below criteria to determine which Responsible Person will receive the treatment intervention. Australian Treasury will not receive any information related to the name, title or contact details for the main or additional Responsible People; this information is only included to ensure clarity on how the Responsible Person is selected.

The preference order will be based on the Responsible Person with the position title most likely to submit the AIS. The preference order by position title will be as follows:

1. Treasurer
 - If the Treasurer email is blank or their email matches the charity AFS email, then preference is given to the next position title listed below and follows the same criteria as specified in this point.
 - Additionally, if there are 2 Responsible People with the same position title that meet the criteria above (i.e. 2 treasurers with unique emails), preference will be given to the Responsible Person with the more recent start date on their RP relationship.
2. Secretary
3. Director
4. President
5. Public Officer
6. Chairperson
7. Committee Member
8. Trustee
9. Board Member
10. Vice-president
11. Deputy Chairperson
12. Other

Outcome measures

Primary outcome

Charity on-time submission.

This will be a binary indicator of a submission of AIS by 31 January 2025 (1 = submitted on time, 0 = not submitted).

Secondary outcome

Time to submission.

This will be measured by days from the reminder email to submission. Note that due to the implementation of the email, charities will receive the email across 12 business days from 6 to 21 January 2025. This outcome will be measured by taking the number of days between when the specific charity's email was sent by the ACNC and when the charity submits their AIS.

For charities that have not submitted at the time of data extraction and analysis, we apply right censoring to include them in the analysis without assuming a future submission date.

Primary outcome

Variable	Charity on-time submission
Measure (instrument, scale, source)	Binary indicator of a submission to AIS by 31 January 2025 (1 = submitted on time, 0 = not submitted).

Secondary outcome(s)

Variable(s)	Time to submission
Measure(s) (instrument, scale, source)	This will be measured by days from the day the reminder email is sent to AIS submission.

Population of interest and sample collection

Population: All charities that have not submitted their AIS statement by 1 January 2025 and do not meet any other exclusion criteria listed below will be sent a second reminder for the 31 January 2025 deadline (all charities receive the first reminder 2–3 months before the due date). If the charity is randomised to the treatment group, the intervention includes an additional reminder email to a Responsible Person for the charity.

Estimated sample size: Approximately 11,000 charities. Given the sample size depends on the number of charities who have not yet submitted their AIS by 1 January 2025, there is some uncertainty regarding the final sample size. Using past data, the ACNC estimates there will be approximately 11,000 charities in the trial, but the final sample size will be determined in January 2025 when the ACNC sends ACE the data for randomisation.

Exclusions: charities with a valid/blank Responsible Person contact email, charities that are exempt from submission, charities that submit paper, bulk or group versions of the AIS, charities that report by calendar year.

Sample size calculations

We aim to power the trial to detect a minimum effect size of 2.5 percentage points increase in on-time submissions of the AIS. This effect size is reasonable considering the mean compliance rate (that is, on-time submission) is already quite high at 70.5%. This is also in line with smallest effect of interest based on the ACNC perspective, which the ACNC have indicated is 2 percentage points.

For this research, we will use the conventional settings of a 5% alpha. Assuming 80% power, this provides stronger control of the Type I error rate than the Type II error rate. We think this is appropriate – we would not want to send letters to Responsible Persons if they do not improve on-time reporting.

The final sample size of this study may vary because it will only be determined in January, once we know how many charities have not yet submitted their statements. Based on previous data and estimates from the ACNC, we estimate the sample size to be approximately 11,000.

The ACNC has identified 2 percentage points as the smallest effect of practical interest. However, with an alpha of 0.05, a baseline rate of 70.5%, and a sample size of 11,000, the calculated power for detecting this effect in a one-tailed test is approximately 75.1%.

One way to increase power is to consider the effect size of 2.5 percentage points. Given the same baseline rate of 70.5% (based on previous data), an alpha of 5%, and a one-tailed test, the calculated power for different sample sizes with this adjusted effect size is as follows:¹

- Sample size of 10,000 (5,000 charities per group): Power = 87.1%
- Sample size of 11,000 (5,500 charities per group): Power = 89.8%
- Sample size of 12,000 (6,000 charities per group): Power = 91.9%

Hypotheses

Main hypothesis:

H1: The on-time AIS submission rate will be higher among charities assigned to receive the new email reminder (to Responsible Person email address in addition to the AFS email) compared to charities assigned to the control (email reminder to the AFS email address only) ($T > C$, one-tailed test).

Secondary hypothesis:

H2: Charities randomly assigned to the treatment group will submit their AIS faster compared to charities randomly assigned to the control group (that is, the time (in days) from the date the charity reminder email was sent to the day of submission will be lower among charities assigned to the treatment group) ($T < C$, one-tailed test).

Randomisation

The ACE will conduct a stratified randomisation for this trial, assigning each charity to a batch of 1,000 based on the order in which their email reminders are scheduled to be sent, using batch number as the stratification variable.

A list of charities will be available in an excel spreadsheet – the ACNC will deidentify and send ACE the csv file containing a charity identifier, and information on each charity's key components: basic religious status, incorporated association, volunteer-based status, charity size and first AIS submission. The ACE will conduct the stratified randomisation process through the following steps:

1. **Data organisation:** Ensure that all relevant fields are accurately completed for each charity and each variable is coded consistently.
2. **Categorising charities and assigning strata block:** Each charity will be randomly assigned to a batch of 1,000, with the batch order corresponding to the order in which their email reminders are scheduled to be sent. The ACNC will adjust the number of emails or batches sent per day as needed to ensure optimal scheduling.

1 Power calculated using R library "stats" package and the following code: `power.prop.test(n = 10,000/2, p1 = 0.705, p2 = 0.73, sig.level = 0.05, power = NULL, alternative = "one.sided")`. For the other cases, n was replaced with 11,000 and 12,000. We do not use multiple hypotheses testing correction in the power calculation.

3. **Randomising charities to treatment and control:** We will randomise all charities to treatment and control within each strata block. This ensures that treatment and control charities are equally distributed across the randomly assigned reminder email send batches.

The stratification variable of batch number will be included in the primary regression model, as below. Within each stratum, the allocation ratio will be 1:1. Randomisation will be coded in R, with the code checked for accuracy before the randomisation is extracted and sent back to the ACNC. No re-randomisation will be performed.

Method of analysis

Primary outcome analysis

Model Specification

We will conduct an Intent-to-Treat analysis using a simple linear probability regression. This model estimates the effect of being assigned to the treatment group (which receive the 2nd email reminder) on the probability that a charity submits its AIS on time.

$$Y_i = \beta_0 + \beta_1 \text{Treatment}_i + \beta_2 \text{Covariates} + \beta_3 \text{Treatment} \times \text{Covariates} + \beta_4 \text{Missingness} + \epsilon_i$$

Where:

- The dependent variable Y is binary outcome – Y = 1 if the charity submits on time. Y = 0 if not,
- β_0 is the intercept,
- Treatment is the treatment indicator (where 0 = control and 1 = treatment, receive second email reminder), β_1 is the coefficient on treatment and represents the average treatment effect,
- Covariates is a vector representing the following covariates: a) charity size based on 2023 AIS submission data (Small/Medium/Large), b) batch number, c) variable indicated whether the charity submitted on time in 2023 (Yes/No). When there is a missing covariate data, the covariate value will be set to 0. β_2 is the vector of associated coefficients,
- Treatment x Covariates is the interaction of the treatment indicator vector with the covariates vector, β_3 is the vector of associated coefficients,
- Missingness is a variable indicated whether any covariate data is missing (Yes/No), β_4 is the coefficient on missing covariates and represents the effect of missing covariates data on the outcomes.
- ϵ is the heteroskedasticity-consistent type 2 (HC2) standard error term.

Note that the covariates listed above (2023 charity size and 2023 on-time submission) will only be available for charities that were required to submit an AIS in 2023. A small number of new charities are registered each year, and their 2023 information therefore doesn't exist.

While new charities will submit their charity size in the 2024 AIS process, the availability of this information will be associated with the treatment effect and is therefore inappropriate to include in the model.

Secondary outcome analysis

Given that we are studying the timing of submissions (which could occur at any point before or after the deadline), a survival analysis approach was chosen for this secondary outcome analysis. This allows us to model the time to event (i.e., from the time the email reminder is sent to the submission of the AIS) and account for right-censoring for those who do not submit by the end of the trial period.

1. **Model:** Kaplan-Meier Survival Analysis.

The Kaplan-Meier estimator is a non-parametric method that allows us to model the time to document submission without making assumptions about the underlying distribution.

The Kaplan-Meier estimator calculates the survival function, S_t , which gives the probability that a charity has not yet submitted its documents by time t .

$$S(t) = \prod_{t_i \leq t} \left(1 - \frac{d_i}{n_i}\right)$$

Where:

- t_i is the time of the i -th event (submission)
 - d_i is the number of events (submissions) at time t .
 - n_i is the number of charities at risk of (those who have not yet submitted) just before time t_i , i.e, those who have neither submitted nor been censored before t_i
2. **Right censoring:** Right censoring happens when a charity does not submit its documents by the time of the analysis, and we do not know whether or when they will submit in the future. These censored charities are included in the analysis up to the point of censoring but do not contribute to the risk set for later time points.
 3. **Kaplan-Meier survival curves:** The curve will display the survival probability over time for both the treatment and the control group. A higher survival probability at any time t indicates that more charities have not submitted by that time. If the survival curve for treatment group declines more rapidly than the control group, it suggests that the reminders are prompting earlier submission. We will summarise the Kaplan-Meier curve by reporting the median survival time for each treatment group separately.

To statistically compare the 2 curves, we will use a one-tailed log-rank-test with 5 per cent level of significance. The test allows us to evaluate whether second email reminders significantly speed up on-time submissions compared to no reminders. The hypothesis for log-rank test is the treatment group (charities receiving second email reminders) has shorter time-to-submission than the control group.

Exploratory subgroup analysis

We chose five different subgroups on which to undertake exploratory subgroup analysis based on the following five characteristics:

- **Charity size:** Charities are categorised as either small, medium, or large based on the ACNC legislative criteria.
- **Incorporated association status:** Charities report whether they are an incorporated association in the AIS. This data will include a Yes or No for the 2 levels.
- **Volunteer-based status:** Charities are classified as volunteer-based if they have no employees but have at least one unpaid volunteer. Otherwise, they are classified as non-volunteer-based. These 2 levels will be indicated with a Yes or No.
- **Basic religious charity status:** Charities can classify themselves as a Basic Religious Charity if they meet specific criteria set by the ACNC's legislation. These 2 levels will be identified with a Yes or No in the data.
- **First AIS:** the ACNC will provide data that indicates whether this is a charity's first time submitting an AIS. This data will include a Yes or No for the 2 levels.

These subgroups were chosen based on policy and strategic relevance, as indicated by the ACNC.

New charities will be excluded from the subgroup analysis for charity size, incorporated association, volunteer-based status and basic religious charity status. This is because the covariate information for new charities will only be available if that charity submits their AIS by the time data is extracted, and the AIS submission is likely to be correlated to the treatment effect.

Regardless, new charities will necessarily be included in the analysis of the first AIS subgroup effect. We will not incorporate any additional covariates information generated after treatment assignment in the analysis for the first AIS submission effect.

To explore how the treatment effect varies across different charity characteristics, we will use an approach including three regressions for each subgroup:

Step 1: We will test whether the treatment effect differs across subgroups through using our primary analysis model with an additional Treatment x Subgroup of interest interaction term in the regression model. This allows us to formally test for heterogeneity in the treatment effect across subgroups. The interaction coefficient will indicate whether and how the treatment effect differs between the levels of the subgroup.

$$Y_i = \beta_0 + \beta_1 \text{Treatment}_i + \beta_2 \text{SubGroup}_i + \beta_3 \text{Treatment}_i \times \text{SubGroup}_i + \beta_4 \text{Covariates} + \beta_5 \text{Treatment} \times \text{Covariates} + \beta_6 \text{Missingness} + \epsilon_i$$

The coefficients of interest are as follows:

- β_3 represents the difference in treatment effects between subgroups,
- β_4 is the coefficient vector representing the effect of the covariates vector as specified above (charity size, batch number and previous on-time submission of the AIS), excluding the covariate related to the specific subgroup of interest in the analysis.

Step 2: We will estimate a separate regression model for charities within one level of the subgroup (e.g., small charities) by splitting the sample. This will provide a direct estimate of the treatment effect for that specific subgroup. The generic model for this will be the same as the regression model listed for the primary analysis as above, but with the specific subgroup of interest removed from the model as a covariate and from the Treatment x Covariates interaction term if the current model is testing that specific covariate. Similar to the model for the primary analysis, when there is a missing covariate data, the covariate value will be set to 0.

For example, for an analysis of charity size, the above steps would be:

Step 1: Interacted model: To examine whether the treatment effect differs based on charity size, we will use the following model:

$$Y_i = \beta_0 + \beta_1 \text{Treatment}_i + \beta_2 \text{Size} + \beta_3 \text{Treatment}_i \times \text{Size}_i + \beta_4 \text{Covariates} + \beta_5 \text{Treatment} \times \text{Covariates} + \beta_6 \text{Missingness} + \epsilon_i$$

- The dependent variable Y is binary outcome – Y = 1 if the charity submits on time. Y = 0 if not,
- β_1 is the coefficient on treatment and represents the treatment effect for the reference group.
- Size_i is a categorical variable representing charity size, β_2 is the coefficient vector representing the differences in outcome between the reference group and the other charity size groups.
- β_3 is the coefficient vector representing the additional treatment effect for the 2 other charity size groups.
- Covariates is a vector representing the following covariates: a) batch number, b) variable indicated whether the charity submitted on time in 2023 (Yes/No). When there is a missing covariate data, the covariate value will be set to 0. Note that charity size is excluded from this vector as this is the primary subgroup of interest for this test.
- *Missingness* is a variable indicated whether any covariate data is missing (Yes/No), β_6 is the coefficient on missing covariates and represents the effect of missing covariates data on the outcomes.

Step 2: Split sample regression: we will conduct a split-sample analysis to estimate the treatment effect separately for small and medium and large charities. This approach provides direct subgroup-specific treatments effects.

For large charities, the model is:

$$Y_i = \alpha + \alpha_1 \text{Treatment}_i + \alpha_2 \text{Covariates} + \alpha_3 \text{Treatment} * \text{Covariates} + \alpha_4 \text{Missingness} + \epsilon_i$$

For medium charities, the model is:

$$Y_i = \gamma_0 + \gamma_1 \text{Treatment}_i + \gamma_2 \text{Covariates} + \gamma_3 \text{Treatment} * \text{Covariates} + \gamma_4 \text{Missingness} + \epsilon_i$$

For small charities, the model is:

$$Y_i = \lambda_0 + \lambda_1 \text{Treatment}_i + \lambda_2 \text{Covariates} + \lambda_3 \text{Treatment} * \text{Covariates} + \lambda_4 \text{Missingness} + \epsilon_i$$

Where α_1 represents the treatment effect for large charity, γ_1 represents the treatment effect for medium charities, λ_1 represents the treatment effect for small charities.

Combining estimates from the interacted model and split-sample regressions allows for a comprehensive analysis of subgroup-specific treatment effects. The interaction model offers a formal test of heterogeneity of the treatment effect, while the split-sample regressions allow for subgroup-specific interpretation of the treatment effect. Together, these methods will provide an understanding of how the intervention impacts different types of charities.

Our analysis may lack sufficient power to detect interactions, as interactions are inherently more challenging to power for compared to main effects. As such, the results of the interaction analyses should be interpreted with caution. Specifically, we will use the estimated effect sizes of interactions as a guide to understanding potential patterns rather than as definitive evidence of subgroup differences. This limitation will be transparently reported in the interpretation of the results.

We will not correct for multiple comparisons due to the exploratory nature of these analysis. We are aware that this will inflate the Type I error rate. Given that these tests are likely correlated, we will pay particular attention to patterns in our data to interpret results carefully and closely examine the consistency of results across tests.

Additional analysis

We will conduct a robustness check of the primary outcome analysis using a logit regression model as an alternative model specification. Logit regression is suitable when the dependent variable is binary. The model will be as follows:

$$\begin{aligned} \log g \left(\frac{P(Y_i = 1)}{1 - P(Y_i = 1)} \right) \\ = \beta_0 + \beta_1 \text{Treatment}_i + \beta_2 \text{Covariates} + \beta_3 \text{Covariates} * \text{Treatment} \\ + \beta_4 \text{Missingness} + \epsilon_i \end{aligned}$$

Where:

- The dependent variable Y is binary outcome: $Y = 1$ if the charity submits on time. $Y = 0$ if not,
- β_0 is the intercept,
- *Treatment* is the treatment indicator (where 0 = control and 1 = treatment, receiving additional email reminder), β_1 is the coefficient of treatment and represents the average treatment effect,
- *Covariates* is a vector representing the following covariates: a) charity size based on 2023 AIS submission data (Small/Medium/Large), b) batch number, c) variable indicated whether the charity submitted on time in 2023 (Yes/No). When there is a missing covariate data, the covariate value will be set to 0. β_2 is the vector of associated coefficients,
- *Treatment x Covariates* is the interaction of the treatment indicator vector with the covariates vector, β_3 is the vector of associated coefficients,
- *Missingness* is a variable indicated whether any covariate data is missing (Yes/No), β_4 is the coefficient on missing covariates and represents the effect of missing covariates data on the outcomes.
- ϵ is the heteroskedasticity-consistent type 2 (HC2) standard error term.

In our analysis, we will report the average marginal treatment effects. If the treatment effect remains consistent across the linear and the logit model, this supports the robustness of the findings. Divergence between models may suggest the choice of model influences the results, requiring further investigation.

Trial threats

We have listed common threats to internal validity below. This list is not intended to be exhaustive.

Non-adherence

Some participants may not actually receive emails, despite being in the treatment group, because charities' emails may be wrong or duplicated etc. It can lead to non-compliance in the treatment group.

Mitigation strategies:

To address this, an intention-to-treat analysis will ensure that all charities with non-missing outcomes data remain part of the analysis, regardless of whether they received the emails, unless the charities have missing outcomes data. However, this approach may dilute the treatment effect, potentially making it appear smaller than its true impact.

Missing data

Missing outcome data can occur due to:

- Attrition: some charities may cease operations during the implementation of the trial.
- Technical issues: there could be system errors in the online system or email reminders.
- Natural disaster: in the event of a natural disaster, deadlines for affected charities will be extended based on their postcodes.

Missing covariate information can additionally occur due to:

- Administrative errors: some charities may not have the correct information or email recorded.

Mitigation strategies:

If the data appears to be missing at random due to unrelated event like a technical issue, we will remove the data from the analysis. Cases with missing outcome data will be removed from the analysis. Imputation of outcome data will not be attempted, as it may introduce bias if the missingness is related to treatment status. Missing covariate data will be imputed as 0 with an additional missingness indicator in the model, regardless of the degree of missingness. This allows the model to account for the missingness explicitly.

Spillovers/contamination

- Behavioural threats: charities in the control group might adjust the timing of their submission if they learn that others are receiving the reminders. This is particularly relevant if we have the same Responsible Person overseeing multiple charities.
- Administrative sharing: Similarly, if multiple charities share the same administration for financial staff, they might apply knowledge from the treatment group across all charities.

Mitigation strategies:

The challenge of identifying charities with shared management or Responsible Person in our data limits our capacity to manage potential spillover effects effectively. It is difficult to accurately identify duplicate Responsible Persons across charities, so there is a risk that observed impacts may be larger than the treatment effects indicate (due to spillover). However, we do not believe that this will be a particularly widespread issue, as internal ACNC estimates suggest that it is likely to be less than 5% of charities with an overlap of Responsible Person.

Blinding and evaluation-driven effects

Since the trial involves sending email reminders, it is impossible to blind the participants to their treatment status. The researchers only know the treatment assignment during the data analysis phase, and do not have direct communication with the participants. Email is a standard method of communication between the ACNC and charities, making it unlikely that charities will be aware they are part of a trial. Therefore, we do not believe there will be significant evaluation-driven effects in this study.

Interpretation of results

The goal is to assess whether email reminders to Responsible Persons improve on-time submissions for charities who report their AIS to the ACNC with a financial year ending 30 June. A significant effect suggests the reminders sent to Responsible Person (in addition to other business-as-usual communications) are an effective compliance nudge.

If no significant effect is observed, this means that we will not have any evidence to suggest these emails improve on-time AIS submission. However, this does not necessarily mean sending additional reminders does not work—it may reflect other factors, such as that the content itself needs to be reworked, or that the reminders alone are insufficient to change behaviour.

Generalisability of the results: It is important to note that the results of the trial may not generalise well to charities with June AIS submission deadlines. This is because the submission behaviour between charities with deadlines in June compared to those in January may differ and we may not be able to reliably predict that the findings will apply to the June cohort.

Pre-analysis plan commitments

No trial data have been collected. We have only analysed historical data before the trial to determine the estimated sample size and potential subgroup size. Any deviations from this pre-analysis plan will be documented and justified in the final report.