



Behavioural
Science
Aotearoa

Using Text-message Reminders to Prompt Payment of Overdue Fines

APPLYING BEHAVIOURAL SCIENCE TO FINE
COLLECTIONS THROUGH TIMELY REMINDERS

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Contents

Executive summary	3
Intervention — what we did	3
Results — what we found	3
Discussion — what we conclude and recommend	4
Introduction — why we ran this trial	6
Intervention — what we did	8
Message design	8
Trial sample	10
Trial design	10
Results — what we found	13
Effect of text-message reminders on any payment behaviour	13
Effect of text-message reminders on any arrangement, any arrangement and any payment	15
Effect of text-message reminders on different groups of people	17
Potential impact of text-message reminders on fine payments	20
Response to the text-message reminder content and tone	20
Limitations of the trial	21
Discussion — what we conclude and recommend	22
Recommendations	23
Appendix 1 — literature review	24
Effects of text-message reminders	24
Factors affecting text-message reminders	25
Appendix 2 — gender and age breakdown	29
Appendix 3 — text-message schedule	30
Appendix 4 — financial breakdown	31
Appendix 5 — analysis of timing	32

Executive summary

When people fail to pay a fine on time, they can face enforcement fees and court summonses. This report describes a behavioural-insights trial by the New Zealand Ministry of Justice (MoJ). This trial is the first comprehensive examination of the effect that text-message reminders have on increasing payment behaviour of overdue fines.

Intervention — what we did

We tested three different text-message reminders against a Control group that received no text message.

The first is the **Standard Message** that the MoJ currently sends to people who have overdue fines:

Hi [First Name] pls call Min of Justice ASAP on 0800434637 (free frm mobile) quote [PPN NUMBER] M–F 0700–2100hrs. 2stp reply STP

This is the **Social Norm Message**. It specifies the purpose of the message, contains few SMS language abbreviations and includes a social norm statement:

Hi [First Name]. Most New Zealanders pay their fines. Please call 0800434637 to discuss your unpaid fine. Quote [PPN NUMBER]. Thanks, Ministry of Justice 2stp rply STP

This is the **Fairness Message**. It includes the same changes as the Social Norm Message but has a different motivational message about fairness.

Hi [First Name]. If you think other people should pay their fines please call 0800434637 to discuss your fine. Quote [PPN NUMBER]. Thanks, Ministry of Justice 2stp rply STP

Using a randomised control trial, we sent one of the three text-message reminders to 15,192 people over four weeks. We compared their payment behaviour to the equal-sized Control group. We examined three outcomes, or behaviours:

- **Any payment behaviour:** a person makes a payment of any amount; has any amount remitted (cancelled); or sets up an arrangement to pay, even if no money under the arrangement is transferred, within 14 days of the text-message reminder.
- **Any arrangement:** a person sets up an arrangement to pay, even if no money under the arrangement is transferred, within 14 days of the text-message reminder.
- **Any Payment:** a person pays any amount within 14 days of the text-message reminder.

Results — what we found

These are our main findings:

- People who receive any text-message reminder are significantly more likely to make a payment or set up an arrangement to pay, compared with people who do not receive a text-message reminder.
- The Standard Message is the most effective text-message reminder, of the three text messages we trialled. Compared with the Control group, people who receive the Standard Message are 37.4% more likely to

perform any payment behaviour, 68.7% more likely to perform any arrangement, and 32% more likely to perform any payment.

- People who receive the Standard Message have significantly higher rates of any payment behaviour than people who receive the Social Norm Message or the Fairness Message. People who receive the Standard Message are 9.4% more likely to perform any payment behaviour than those who receive the Social Norm Message¹ and 16.8% more likely than people who receive the Fairness Message.
- People who received one of the three text-message reminders paid 36.4% more, within 14 days of the text message being sent, than the Control group (\$264,331 compared with \$193,835).

Discussion — what we conclude and recommend

This trial provides strong quantitative evidence that sending text-message reminders is an effective way to increase payment of overdue fines. It also demonstrates the importance of the content of the text message. The superiority of the Standard Message is an interesting finding, which provides an insight into how people respond to reminders about fine-related debt. One possible explanation for this finding is that the Social Norm Message and Fairness Message clearly state that the recipient owes a fine, whereas the Standard Message communicates a request to call and not a reason why. This ambiguity may encourage some people to respond, while people may ignore the other messages without fearing that the reason is more serious.

Based on the findings of this trial we recommend the Collections team implements these actions:

1. Continue sending the Standard Message

The Standard Message has a significantly greater effect on any payment behaviour than sending no text-message reminder or sending the Social Norm Message or Fairness Message. Therefore, we recommend using the Standard Message as standard practice, and exploring how to use text-message reminders more systematically to collect fines.

2. Test variations to the content, timing and frequency of text-message reminders

While the Standard Message performed the best, of the three text messages we trialled, we expect there is room to improve text-message reminders. Potential improvements could be gained by varying the content, frequency or timing of the text message.

Although timing did not make a difference in this trial, the times we sent text messages were relatively close together. It could be worthwhile investigating bigger time differences (such as morning versus evening) or sending messages before a fine becomes overdue.

In this trial we sent only one text-message reminder. It could also be worthwhile investigating if more frequent messages make any difference and exploring text-message reminders alongside other Collections messaging and fine-repayment activities.

3. Test different communication methods

This trial did not compare the effects that text messages have on payment behaviour with the effects of other reminder methods. However, superficially, it appears that the rate of any payment behaviour is lower in this trial

¹ This difference is driven by the rate of people setting up arrangements to pay.

than in previous fine trials. A future trial could simultaneously compare text messages with other methods, such as email and letters, to see which method is most effective and for which groups of people.

4. Test the effects of ambiguous content in other communication methods

One explanation for this trial's results is that the content in the Standard Message is ambiguous. It is possible that ambiguity could be effective in other communication methods, such as emails and letters. One way to test this would be removing the MoJ logo from envelopes containing reminder letters (in other words, if people already know an envelope contains letter about their fine, they may avoid opening it).

Introduction — why we ran this trial

This trial tested the impact that text-message reminders have on people's likelihood to pay an overdue fine to the Ministry of Justice (MoJ). It was run by MoJ's Operations and Service Delivery Group, Analytics and Insights team, and Behavioural Science Aotearoa (BSA).

When a fine is imposed, the recipient of the fine is sent a system-generated Notice of Fine (NoF) in the mail. If the recipient does not pay, or make an arrangement to pay, the fine within 28 days of the NoF, MoJ attempts to contact them by sending more letters, calling them on the phone or sending text message. MoJ may also use other enforcement activities (such as mandatory deductions from their salary or wages to recover a fine).

Results of our previous behavioural-insights trials

In 2018, we trialled using behavioural insights to improve the response rate to NoFs. In July and August 2018, we found that a simplified reminder letter, containing a 'social norm' that points out that most people pay their fine, increases payments of overdue fines by 7.2%. In December 2018, we attempted to improve on the results of this trial by using custom-printed envelopes aimed at nudging people to open their letters and, hopefully, increase their payment behaviour. We trialled two different messages, which were handwritten, scanned and printed on the front of the envelopes:

- A formal message: '**OPEN IMMEDIATELY**'
- An informal message: 'You really need to open this'

The rate of full payment by people who received the formal message was 12.2% higher than people who received a plain envelope.

Letters are proven to be effective but are limited by the time and effort needed to send them, the time it takes for them to arrive, and the chance that people do not open or read them. Our next logical step was, therefore, to test the effect of using electronic channels to remind people to pay their fines.

Rationale for a behavioural-insights trial of text-message reminders

MoJ's Collections Unit (Collections) has previously used text messages and email on an ad-hoc basis. Anecdotal reports indicate that these channels are successful at increasing calls to the contact centre. Anecdotally we know that people respond quicker to text messages than letters, as they can click on the phone number in the text message to contact MoJ immediately. We (Behavioural Science Aotearoa) sent text-message reminders to people who have an unpaid fine and a mobile phone number on our records.

People often procrastinate and forget to complete tasks that we intend to do.² We are even more likely to avoid tasks that involve a financial loss (like paying a fine or bill), as we dislike losses and tend not to accurately weigh up the larger future loss of not paying the fine (that is further costs or court appearances) against the current smaller loss.³ In this trial we hypothesised that:

² Ferrari, J. R., Johnson, J. L., and McCown, W. G. (1995). An overview of procrastination. In: Procrastination and task avoidance. *The Springer Series in Social Clinical Psychology*. Springer, Boston, MA. https://doi.org/10.1007/978-1-4899-0227-6_1

³ Brown, J. R., & Previatero, A. (2014). *Procrastination, Present-Biased Preferences, and Financial Behaviors*. Prepared for the 16th Annual Joint Meeting of the Retirement Research Consortium, August 7–8 2014, Washington DC.

- many people forget to pay, or procrastinate about paying, their fines
- people will be more likely to pay their fine if they receive a reminder that clearly outlines the desired behaviour, and how to complete that behaviour and includes a behavioural message that motivates them to pay.

We know that people who have financial stress may be more likely to forget to pay, or procrastinate about paying, their fine, because this stress can impact peoples memory⁴. Given this, we assume that a text-message reminder may be particularly helpful for some people in this situation.

However, we cannot assume that everyone fails to pay their fine on time because they forget or procrastinate paying. Many people who fail to pay their fine may not have the means to pay it or may have to prioritise paying other expenses. Therefore, it is important to remember that the people most likely to change their behaviour after receiving a text-message reminder are those who have forgotten to pay their fine, or procrastinated about paying, but can pay.

⁴ Mullainathan, S., & Shafir, E. (2013). *Scarcity: Why Having Too Little Means So Much*. Macmillan.

Intervention — what we did

Based on a review of evidence (see Appendix 1 for our literature review), results of previous trials and the number of eligible participants, we used a randomised control trial (RCT) to trial three different text-message reminders ('treatments') alongside a Control group. Each message has a 160-character limit and an automatically added suffix '2stp rply STP', which means to stop getting these text messages reply to this text with STP.

Message design

Control group — no text message

Collections does not currently send text-message reminders in a systematic way (for example, a certain number of days after a fine becomes overdue). Therefore, not everyone with an overdue fine will necessarily receive a reminder by text message. We wanted to determine if receiving a text-message reminder has any positive or negative effect on people's payment behaviour.

The Control group provides us with a baseline against which to measure payment rates. We did not send the Control group any text message. This allows us to measure the effect that receiving any type of message, regardless of its content, has on payment behaviour. It is important to note that the Control group may have been contacted by MoJ as part of a separate collection effort.

People in the Control group were extracted alongside those in the Treatment groups. They were also assigned to a week and day, so that we could compare their payment behaviour of different conditions along the same timelines (see also Trial design).

Treatment group 1 — Standard Message

Collections has a standard text-message reminder that it uses to communicate with people who have overdue fines. Anecdotal evidence suggests the response rates to this message are already good; however, Collections does not have quantitative data on payment behaviour.

This is the Standard Message:

Hi [First Name] pls call Min of Justice ASAP on 0800434637 (free frm mobile) quote [PPN NUMBER] M–F 0700–2100hrs. 2stp reply STP

This message is personalised and includes details to help the person take action and pay their fine (that is it includes a call to action, phone number to call and the person's customer code or 'PPN'). This is a well-designed message; however we wanted to know these changes would make it more effective:

- **Removing the use of SMS language** (that is, abbreviations). Previous research has not looked at whether SMS language has a negative effect on behaviour, but some studies suggest it can have a negative effect on people's comprehension of the message and lead them to perceive the communication as less formal.⁵ Now

⁵ van Dijk, C. N., van Witteloostuijn, M., Vasić, N., Avrutin, S., & Blom, E. (2016). The Influence of texting language on grammar and executive Functions in primary school children. *PLoS ONE*, 11(3). <https://doi.org/10.1371/journal.pone.0152409>

that more people own a smartphone, which do not have character limits for text messages, the multiple abbreviations in the Standard Message may be outdated.

- **Using behavioural motivating messages.** The Standard Message already includes a call to action ('pls call Min of Justice ASAP'), but this could be more specific if it includes contextual information (for example: 'please call to discuss your unpaid fine'). Describing the reason for the desired behaviour can reduce people's confusion, especially if some do not remember they have a fine to pay.
- **Changing to a new message.** The novelty of a different message may have an effect on payment behaviour.

Treatment group 2 — Social Norm Message

This is the Social Norm Message:

Hi [First Name]. Most New Zealanders pay their fines. Please call 0800434637 to discuss your unpaid fine. Quote [PPN NUMBER]. Thanks, Ministry of Justice 2stp rply STP

This message adds two elements to the Standard Message:

- It changes the language in these ways:
 - it adds 'Thanks' and includes 'Please' in full
 - it avoids SMS language abbreviations (with the exception of the suffix)
 - it removes the call centre opening hours ('M–F 0700–2100hrs')
 - it removes 'free frm mobile'.
- It adds a social norm message: 'Most New Zealanders pay their fines.'

The social norm simply describes what most people do. We have used similar social norms in fine-reminder letters; however, in letters, we say, 'The majority of people pay their fines. You are now part of a minority of people who are yet to pay.' The Social Norm Message does not explain the situation as directly as the fine-reminder letter (it does not mention that the person is 'yet to pay') but it is more specific about the in-group, by saying 'most New Zealanders' instead of 'most people'.

Treatment group 3 — Fairness Message

This is the Fairness Message:

Hi [First Name]. If you think other people should pay their fines please call 0800434637 to discuss your fine. Quote [PPN NUMBER]. Thanks, Ministry of Justice 2stp rply STP

This message is like the Social Norm Message. However, instead of including a social norm, it includes a motivational message: 'If you think other people should pay their fines please call 0800434637 to discuss your fine.' The Fairness Message aims to leverage people's perceptions of fairness, by highlighting their attitude towards other people paying

finances and asking them to be consistent in their own behaviour. This message draws on a UK example that uses messages on webpages that leverage fairness and cognitive dissonance⁶ to increase organ donations.⁷

Many people have attitudes and values about fairness, but they tend to exclude themselves from behaviours they believe others should perform. By asking people to reflect on whether others should perform a behaviour, the message aims to use the cognitive dissonance they feel — between what they believe is fair and their inaction to pay their fine — to motivate them to change their behaviour. This technique is effective in a range of health-behaviour contexts,⁸ but, as far as we know, has not been trialled in a similar context to paying fines.

People's perception of whether fines are 'fair' is an important factor in whether their inaction to pay a fine creates any dissonance. That is, if their attitude is that fines are unfair or illegitimate, they may not agree that other people should pay their fines; therefore the Fairness Message may not give them any additional motivation to pay their own fine.

Trial sample

Our initial sample consisted of 35,679 people randomly drawn from approximately 120,000 eligible people. (To be eligible when we extracted data, a person needed to have at least one outstanding fine, have made no arrangement to pay their fine, and have a mobile phone number recorded.) Of our random sample, 33,555 had their gender recorded and 35,586 had their date of birth recorded.

Our sample was reduced to 30,209 once the data was cleaned during the analysis (see Data cleaning). See Appendix 2 for the breakdown of our final sample by gender and age.

We carried out power analysis using an online power calculator. Based on previous trials of sending reminder letters, and assuming 80% power at a 0.05 significance level, we estimated we needed a minimum number of 4,286 people in each treatment group. To achieve the best results, we used 6,000 as the minimum size for each treatment group. This gave us a buffer in case of sending or receiving errors (for example, if the mobile number in our records was inactive).

Trial design

During the trial, each week the Analytics and Insights team extracted a random sample of 9,000 eligible candidates from the total eligible population in the COLLECT database. Each week's sample excluded people who had been in a previous sample for this trial. Each person in the sample was then randomly assigned to one of the four groups (Control group or one of the three treatment groups). People were randomised using a ratio of 3:1:1:1. This means

⁶ Cognitive dissonance is the idea that it is very uncomfortable to have two ideas beliefs or behaviours that contradict each other. For example, believing that smoking is bad and yet smoking a pack a day. Cognitive dissonance would say that in order to resolve this contradiction I would either stop smoking or justify why smoking is okay to myself - Tavis, C., & Aronson, E. (2020). Mistakes were made (but not by me): Why we justify foolish beliefs, bad decisions, and hurtful acts. Houghton Mifflin Harcourt.

⁷ Cabinet Office Behavioural Insights Team. . *Applying Behavioural Insights to Organ Donation: Preliminary Results From A Randomised Controlled Trial*. Retrieved from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/267100/Applying_Behavioural_Insights_to_Organ_Donation.pdf

⁸ Freijy, T., & Kothe, E. J. (2013). Dissonance-based interventions for health behaviour change: a systematic review. *British Journal of Health Psychology*, 18(2), 310–337. <https://doi.org/10.1111/bjhp.12035>

each week there were approximately 4,500 people assigned to the Control group and 1,500 assigned to each of the three treatment groups. Over the course of the trial, 15, 017 people were included in the Control group and 15, 192 were included in one of the three treatment groups.⁹

Once the sample was randomised to one of the four groups, each group’s sample was separated into one of 15 other groups that each represented a day and time the following week. The group lists were then sent to the Collections Unit to upload to the Web2txt platform and schedule sending the relevant text message. Web2txt automatically adds the variable details to each message, such as the customer code (PPN) and recipient’s name.

The time that people are sent the text message is an important factor to consider. For this trial we used set times each day to try to control for time-related variables that may influence behaviour.¹⁰ The text messages were sent at three times — 10 am, 12 pm and 2 pm — on Monday to Friday for four weeks (that is, 15 time slots each week). We sent approximately 300 text messages at each time slot, which is equivalent to approximately 900 messages each day).¹¹ At each time slot we sent one of the three different messages. Each day we sent each of the three different text messages, but we varied the time slots when they were sent (see Appendix 3 for the text-message schedule).

We decided to not send equal numbers of text messages at each time slot, to make the process less resource intensive and to limit opportunities for human error. However, the batches of each type of text message sent were equal distributed over the course of the trial (see Table 1).

Table 1. Number of batches of each type of text message sent at each time slot

Time slot	Standard Message	Social Norm Message	Fairness Message
10 am	7	6	7
12 pm	7	7	6
2 pm	6	7	7
Total	20	20	20

Time slot	Standard Message	Social Norm Message	Fairness Message
10 am	5	8	7
12 pm	7	7	6
2 pm	8	5	7
Total	20	20	20

Outcome measures

We looked at the occurrence of three outcomes (behaviours) (see Table 2 for a description of the behaviours).

Table 2. Description of behaviours

⁹ Initially we included companies who owed fines; however, we later decided not to send text messages to companies. Therefore, we removed companies from our sample, which resulted in having slightly lower numbers for each group than we had anticipated.

¹⁰ We did not look at frequency of text messages in this trial, as we were more interested in the impact of a single text message on a single instance of behaviour.

¹¹ Sending 900 messages each day, for five business days over four weeks ensured we could send messages to our total sample of approximately 18,000 people.

Behaviour	Behaviour definition
Any payment behaviour	Makes a payment of any amount; has any amount remitted; or sets up an arrangement to pay, even if no money under the arrangement has been transferred within the measurement period (3, 7 or 14 days).
Any arrangement	Sets up an arrangement to pay, even if no money under the arrangement has been transferred within the measurement period
Any Payment	Pays any amount within the measurement period

Our primary outcome measure is any payment behaviour. Our secondary outcomes measures are any arrangement and any payment. Any arrangement and any payment are not mutually exclusive — people who set up an arrangement to pay and make a payment under that arrangement are counted for both outcome measures.

For each of the outcome measures, we looked at what payments had been made 3, 7 and 14 days after sending each text message. The text messages did not specify a timeline, so these are arbitrary dates. However, Collections staff say that people tend to respond to text messages within the first few days of receiving them. Based on this, we extracted three measurement periods (3, 7 or 14 days) to see if there were ongoing behavioural responses beyond the first few days or weeks after the text messages were sent.

Collections staff can match incoming mobile numbers with the list of phone numbers we sent text messages to. This indicates how many messages elicited a direct response. It also confirms that the text messages are received.

Data cleaning

When we reviewed the status of text messages we had sent, we found 13.1% had a 'delivery error'. The percentage of delivery errors varied between the treatment groups: 19.8% of the Social Norm text messages resulted in a delivery error, compared with 12.8% of Fairness text messages and 6.6% of the Standard text messages.

When we investigated this variation, we found that if the Social Norm Message and Fairness Message is sent to a person whose name is longer than seven or eight characters, respectively, the total length of the text message exceeds the 160-character limit. Although this is not the cause of all delivery errors, it does potentially mean fewer people in Treatment groups 2 and 3 received a text-message reminder. Therefore, to balance the sample between the three treatment groups, in the final analysis we removed everyone whose name is longer than seven characters. This resulted in us removing 5,470 people from our original sample of 35,679, which reduced our final sample to 30,209 people.

Data analysis

We used Z-tests to compare differences — in the rates of any payment behaviour, any arrangement, any arrangement and any payment within 14 days of receiving a text-message reminder — between the Control group and each treatment group. We applied a Bonferroni correction (adjusted significance level of 0.0167) to account for making three comparisons (between the Control group and each of the three treatment groups).

We used Chi squared tests to detect differences in the rates of any of the outcome measures, within 14 days of text-message reminders being sent, against categorical variables such as gender.

We also used logistic regression to model the probability of a person carrying out any payment behaviour, within 14 days of being sent a text-message reminder, against variables including treatment group, age, gender, amount owed and the age of the fine (that is, how much time had passed since the person's most recent fine). We tested interactions between the treatment groups and other variables and retained significant interactions in the model.

Results — what we found

Here are our main findings from this trial:

- **All text-message reminders are effective.** People who receive any type of text-message reminder have significantly higher rates of any payment behaviour, any payment and any arrangement, any arrangement.
- **People who receive a text-message reminder pay 34.8% more**, on average, than people who do not receive a reminder.
- **The Standard Message is the most effective text-message reminder**; people who receive the Standard Message have significantly higher rates of any payment behaviour than people who receive the Fairness Message or Social Norm Message. The Standard Message performs significantly better than the Fairness Message across all outcome measures. The significant difference between the Standard Message and the Social Norm Message is driven by a higher rate of setting up arrangements to pay.
- **The age of the most recent fine has a significant impact on a person's payment behaviour.** People whose fines are more recent have higher rates of any payment behaviour.
- **People who owe more than \$200 have lower rates of any payment behaviour than people who owe more than \$500.** This difference is less among people who receive a text-message reminder, which indicates that text messages are most effective for people who owe smaller amounts.
- **People aged 50 years and over have higher rates of any payment behaviour when they receive a text-message reminder**, particularly if they receive the Standard Message. This finding is, at least in part, explained by the fact that people in this age group also tend to owe smaller amounts and their fines are more recent.
- **The day and time that text-message reminders are sent does not affect people's payment behaviour** (see Appendix 5).

Effect of text-message reminders on any payment behaviour

Effect of any text-message reminder

People in the treatment groups (that is, people who received one of the three text-message reminders) have significantly higher rates of any payment behaviour (this includes making a payment, setting up an arrangement to pay, of having an amount remitted), within 14 days of receiving the reminder,¹² than people in the Control group (see Figure 1).

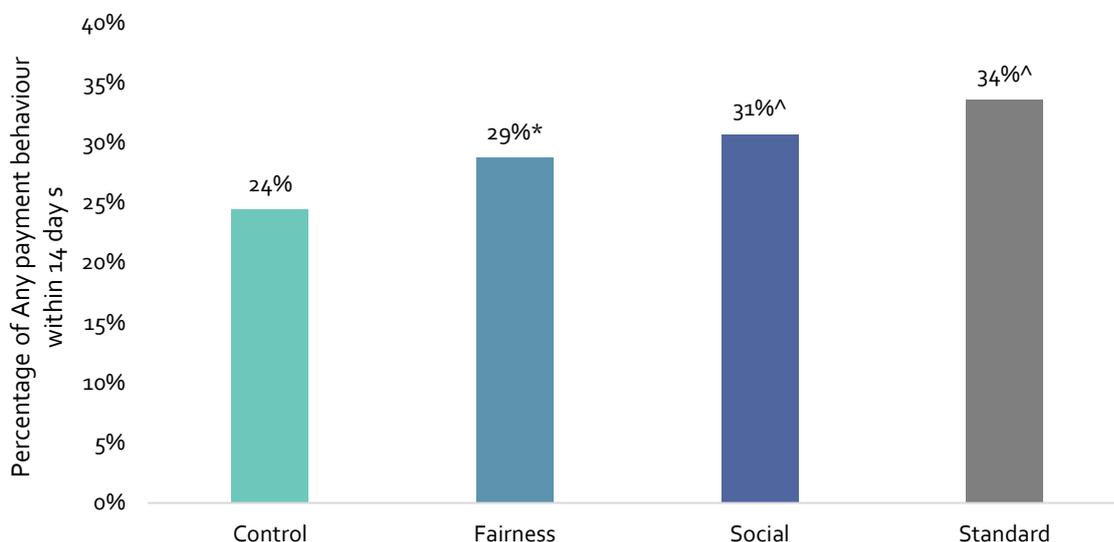
People who receive the Standard Message are 37.4% more likely to complete any payment behaviour than people who receive no text-message reminder. This is a significant difference of 9.14 percentage points (33.59% versus 24.45%, $p < 0.01$).

People who receive the Social Norm Message or Fairness Message also have significantly higher rates of any payment behaviour than people who receive no text-message reminder. The difference between Treatment group 2 (Social Norm Message) and the Control group (no text message) is 6.24 percentage points (30.69% versus 24.45%,

¹² For most of our comparisons, we use a 14-day extract point, which limits the number of comparisons we make. It also gives people enough time to respond to the text-message reminders, while acknowledging that they are unlikely to have long-term effects on payment behaviour.

$p < 0.01$) or 25.5% relative difference. The difference between Treatment group 3 (Fairness Message) and the Control group (no text message) is 4.32 percentage points (28.77% versus 24.45%, $p < 0.01$) or 17.67% relative difference.

Figure 1: Effect of text-message reminders on any payment behaviour within 14 days



* Significant ($p < 0.01$) compared with all other treatment groups

^ Significant ($p < 0.01$) compared with the Control group only

Effect of different text-message reminders

People who receive the Standard Message have significantly higher rates of any payment behaviour than people who receive the Social Norm Message or Fairness Message.

The difference between Treatment group 1 (Standard Message) and Treatment group 2 (Social Norm Message) is 2.9 percentage points (33.59% versus 30.69%, $p < 0.01$) or 9.45% relative difference. This difference is driven by the rate of people setting up arrangements to pay (21.46% versus 17.96%, $p < 0.01$), as there is no significant difference in the any payment between the two treatment groups (23.98% versus 22.63%).

The difference between Treatment group 1 (Standard Message) and Treatment group 3 (Fairness Message) is 4.82 percentage points (33.59% versus 28.77%, $p < 0.01$) or 16.75% relative difference. The difference between these two treatment groups is significant for all three outcome measures.

There are no significant differences in the outcome measures for people who receive the Social Norm Message and those who receive the Fairness Message.

Effect of text-message reminders on any arrangement, any arrangement and any payment

The effects of text-message reminders on any arrangement, any arrangement and any payment are largely the same as they are on any payment behaviour (see Table 3). People who receive the Standard Message have significantly higher rates of any arrangement any arrangement and any Payment than people in Treatment group 2 (Social Norm Message), Treatment group 3 (Fairness Message) in the Control group (no text-message reminder). The one exception is that there was no significant difference in any Payment between people who receive the Standard Message and those that receive the Social Norm Message.

Effect of any text-message reminder

Compared with people who receive no text-message reminder, people who receive the Standard Message have a:

- 68.71% higher rate of any arrangement (21.46% versus 12.72%, $p < 0.01$)
- 31.98% higher rate of any payment (23.98% versus 18.17%, $p < 0.01$).

Compared with people who receive no text-message reminder, people who receive the Social Norm Message have a:

- 41.19% higher rate of any arrangement (17.96% versus 12.72%, $p < 0.01$)
- 24.55% higher rate of any payment (22.63% versus 18.17%, $p < 0.01$).

Compared with people who receive no text-message reminder, people who receive the Fairness Message have a:

- 26.89% higher rate of any arrangement (16.14% versus 12.72%, $p < 0.01$)
- 14.42% higher rate of any payment (20.79% versus 18.17%, $p < 0.01$).

Effect of different text-message reminders

People who receive the Standard Message have higher rates of any arrangement than:

- people who receive the Fairness Message: 32.96% higher (21.46% versus 16.14%, $p < 0.01$)
- people who receive the Social Norm Message: 19.49% higher (21.46% versus 17.96%, $p < 0.01$).

People who receive the Standard Message have higher rates of any payment than:

- people who receive the Fairness Message: 15.34% higher (23.98% versus 20.79%, $p < 0.01$).

People who receive the Social Norm Message have higher rates of any arrangement than:

- people who receive the Fairness message: 11.28% higher (17.96% versus 16.14%, $p < 0.0167$).

Table 3: Effect of text-message reminders on outcome measures within 14 days

Group	Number	Any Payment		Any arrangement		Any amount remitted		Any payment behaviour**		Call matched
		Number	%	Number	%	Number	%	Number	%	%
Control group	15,017	2,728	18.17	1,910	12.72	159	1.06	3,671	24.45	-
Treatment group 1: Standard Message	5,055	1,212	23.98*	1,085	21.45*	80	1.58	1,698	33.59*	19.24
Treatment group 2: Social Norm Message	5,100	1,154	22.63^	916	17.96^	73	1.43	1,565	30.69^	12.58
Treatment group 3: Fairness Message	5,037	1,047	20.79^	813	16.14^	59	1.17	1,449	28.77^	11.95
Treatment combined	15,192	3,413	22.47	2,814	18.52	212	1.36	4,712	31.02	14.58
Total participants	30,209	6,141	20.33	4,724	15.64	371	1.23	8,383	27.75	

*Significant ($p < 0.01$) compared with all other treatment groups

^ Significant ($p < 0.01$) compared with the Control group only

** Rates of any payment behaviour are not the sums of the other outcome measures, as they include each person only once when the person may have set up an arrangement, made a payment and had an amount remitted.

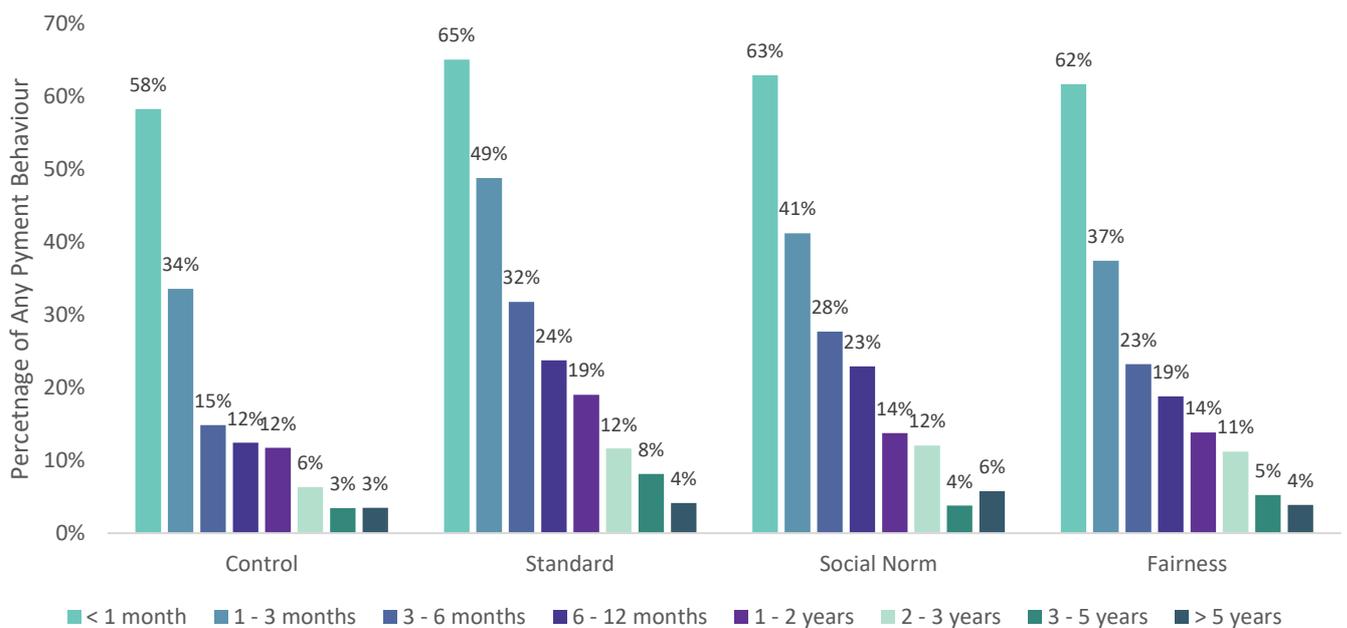
Effect of text-message reminders on different groups of people

Age of most recent fine

The age of a person’s most recent fine (number of days since it was issued) affects their payment behaviour.¹³ In general, the more time that has passed since a person received their most recent fine, the less likely they are to exhibit any payment behaviour. For example, among people who receive no text message, when controlled for other variables,¹⁴ someone with a fine that is 12-months old is 50% less likely to exhibit any payment behaviour than someone whose fine is 30-days old.

However, regardless of the age of their most recent fine, people who receive a text-message reminder, especially those that receive the Standard Message, have higher rates of any payment behaviour, within 14 days, than people who receive no text-message reminder (see Figure 2).

Figure 2: Rates of any payment behaviour within 14 days of text-message reminder, by age of most recent fine



Amount owed

People who owe more money are more likely to act within 14 days of receiving a text reminder (see Figure 3). Payments were highest for large fines across both treatment and control groups, reflecting the effect of other collections efforts for larger fines. However, payment rates were also high for those with small fines who received a text message compared to the control who did not receive a message. This may be because smaller fines are not targeted by other collections efforts, so the text-message reminder could be the only communication about their fine that people with smaller fines receive. We found evidence that the impact of the text-message reminders differ

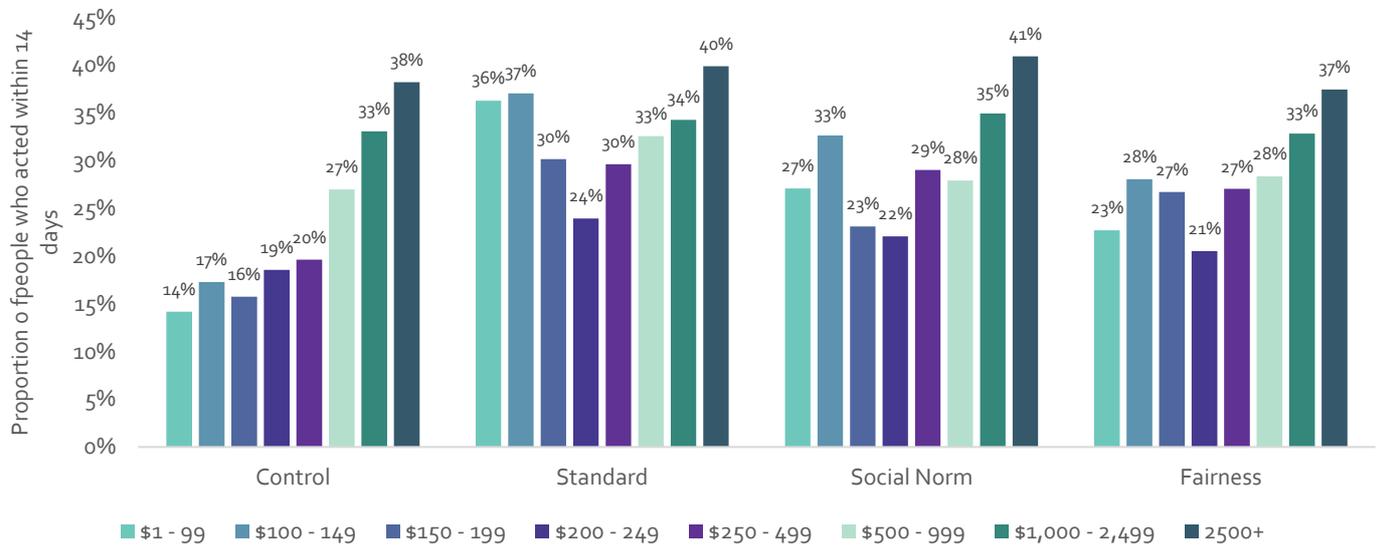
¹³ This measures the time since a person’s most recent fine. It does not take into account other older fines they may have.

¹⁴ The other variables are the type of text-message reminder sent, the amount owed, age and gender.



based on the amount owed — the Standard Message performs better than the other types of text-message reminders, even among people who owe smaller fines.

Figure 3: Rates of any payment behaviour within 14 days of text-message reminder, by amount owed



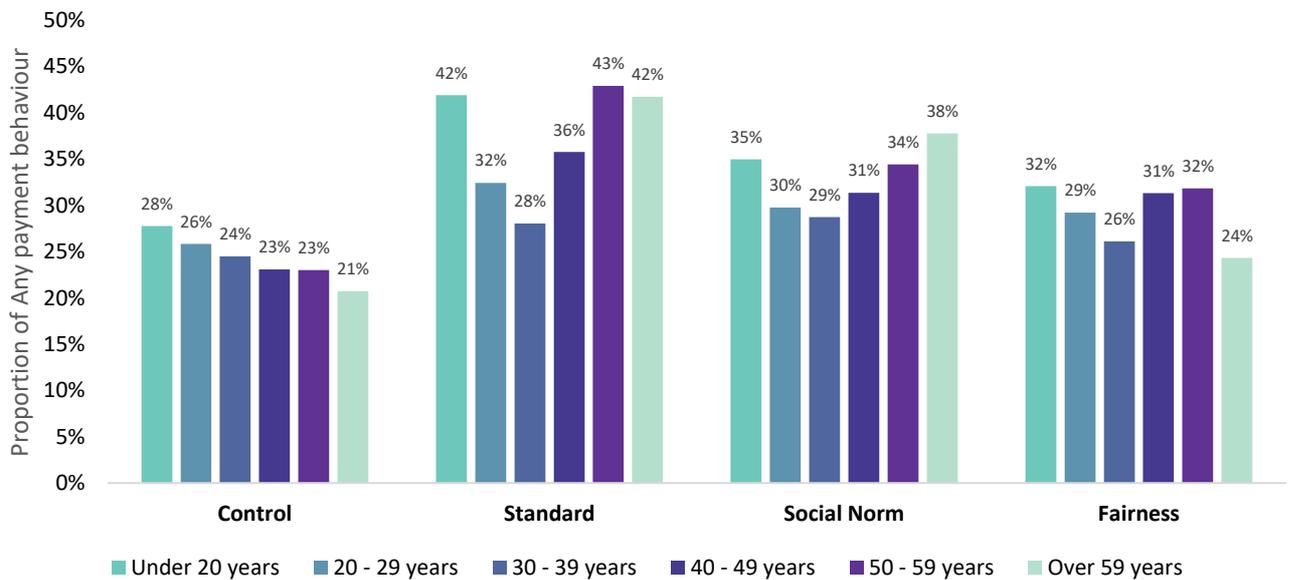
Age group

Payment behaviour differs between age groups. The Social Norm Message and Standard Message are more effective, than the Fairness Message or no text-message reminder, among people aged under 30 or over 49 years (see Figure 4). All text messages have the least effect on people aged 30 to 39 years.

These trends may be partially accounted for by the amount owed and age of most recent fine. On average, people over 49 years have smaller fine amounts (text-message reminders have the greatest effect on people with smaller fines), while people aged 30 to 39 years have the oldest fines (text-message reminders have the least effect on people with older fines). However, even after accounting for the fine amount and age of most recent fine, the trends in payment behaviour between age groups still exist.



Figure 4: Rates of any payment behaviour within 14 days of text-message reminder, by age group

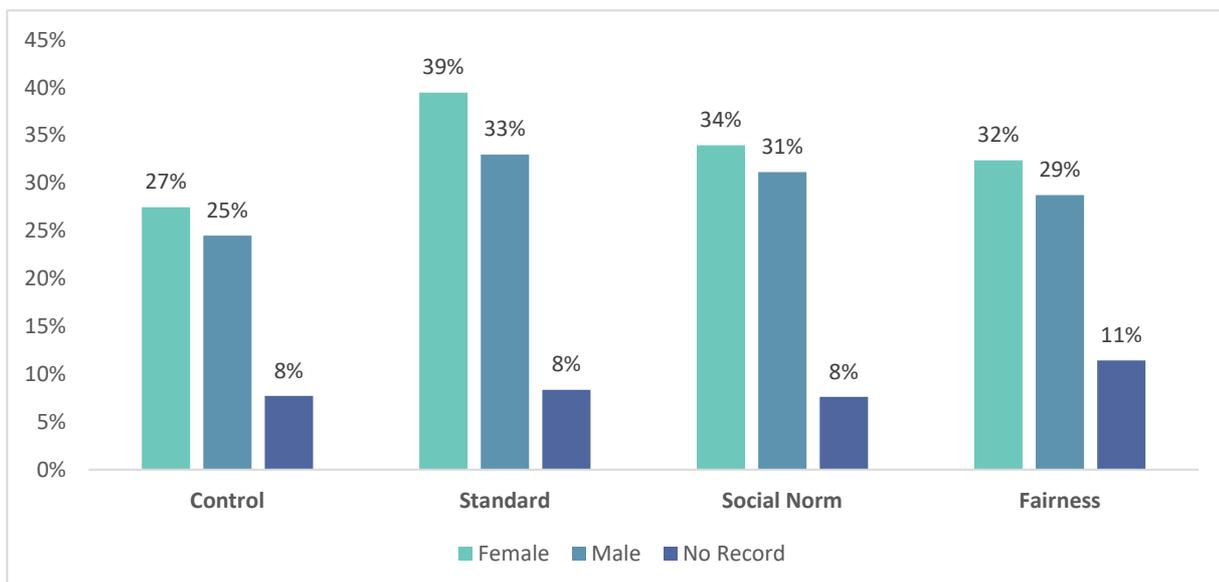


Gender

Women are more likely than men to exhibit any payment behaviour within 14 days of receiving a text-message reminder (see Figure 5). Our analysis suggests this effect is still significant even when people are the same age, receive the same text-message reminder, have fines of the same age and owe the same amounts.

We did not have gender recorded for approximately 6% of people in our final sample. This group have much lower rates of any payment behaviour, which may be explained by their fines being, on average, much older and smaller amounts.

Figure 5: Rates of any payment behaviour within 14 days of text-message reminder, by gender



Potential impact of text-message reminders on fine payments

In this trial, people who did not receive a text-message reminder paid \$193,835¹⁵ during the 14-day measurement period, while people who received any text-message reminder paid \$264,331. This equates to a 36.3% difference (see Appendix 4 for a financial breakdown).

The Standard Message led to significantly higher rates of any payment behaviour than the other two text-message reminders. If we had used only the Standard Message during the trial period, we estimate the amount paid would have been approximately \$318,941. This equates to a 44% difference to the amount paid by people in the Control group during the trial.

Extrapolating further, if Collections was to use the Standard Message and send it at the same rate as we did during the trial (900 per day), we could expect it to generate approximately \$80,230 each week¹⁶ and \$3,209,202 in one year.¹⁷ We also estimate that it would result in around 354 extra arrangements to pay being made each week, which is equivalent to 14,172 extra arrangements to pay being made in one year.

Response to the text-message reminder content and tone

Collections recorded 143 replies to the text-message reminders. Most replies (68) were from people who either indicated they were not the person named in the text message, or who asked to receive no more messages.¹⁸ Another 23 replies were from people who said they had already paid or resolved the fine in some way (for example, by setting up an arrangement to pay). Another 29 replies were from people who were confused about the text message or wanted more information.

While the number of replies is too small to test for significance, it appears that the behaviourally informed messages elicited more replies than the Standard Message. Of the 143 people who replied, 30 were sent the Standard Message, 60 were sent the Social Norm Message and 53 were sent the Fairness Message.

Most replies did not have an obvious negative or positive tone. Of those that did, five replies were distinctly positive, for example:

Hey, sorry but you seem to have the wrong number. All the best finding the correct one. Have a good day! Xx
Will call you now sorry :) thanks for the reminder.

While also a small proportion of all replies, 14 were distinctly negative. Interestingly, these replies were all in response to one of the behaviourally informed messages. Most replies were dismissive, while three gave feedback on the text-message content or tone:

¹⁵ This figure does not include payments from people who were removed from the analysis.

¹⁶ This figure does not include the potential revenue that could be realised if all arrangements that are set up are paid in full.

¹⁷ This figure assumes that Collections sends the Standard Message for 40 weeks (200 days) and has enough eligible candidates. Based on the eligible population for this trial (120,000 people), we would have only been able to send 900 text-message reminders each day for 133 days.

¹⁸ People could opt out of receiving further text messages by replying 'STP', as indicated by the suffix to the message, '2stp reply STP'.



Trying to fine me for a suspended license? U need to get your facts right. Is this another attempt of the nz govt to exploit citizens with bullying tactics?

Whoa, passive aggressive!

This message re most new zealanders marginalises people and is racist. Are you saying no new zealanders are different? It is bullying from the state by public servants picking on people whose circumstances are unlike yours ie paid a government salary from tax payer money. I find your message offensive and discriminatory.

Limitations of the trial

The most substantial limitations of this trial are the assumptions we have made about payment behaviour. We could not control various factors that may influence a person's likelihood to pay. While we can assume these factors affect each treatment group equally, because we randomly allocated people to groups, we cannot be sure about the extent to which observed differences, between treatment groups and between the Control group, are solely the result of text-message reminders. For instance, we cannot assess how payment behaviour is affected by other simultaneous efforts by Collections or by the recipients' previous experience with text-message reminders, or other types of reminders.

Given the differences in payment behaviour by fine amount, we surmise that people with larger fines are already being chased and, therefore, less affected by receiving another text-message reminder. However we cannot state this conclusively. We have also assumed that everyone who made a payment during the 14-day payment window did so because of the text-message reminder they received.



Discussion — what we conclude and recommend

In this section we present our conclusions and outline our recommendations.

Text reminders encourage people to pay overdue fines

This trial provides strong quantitative evidence that text-message reminders increase payment behaviours related to overdue fines. This is an important finding, and one that supports findings from previous trials of using text-message reminders for one-off behaviours.

This is the first trial we have run that collected data from a pure control group. These results provide us with useful baseline rates of payment behaviours (within 3, 7 and 14 days of receiving text-message reminders) that we can use to help us design future trials. The Control group's rate of any payment behaviour seems relatively high (24.45% within 14 days); however, this is likely to reflect MoJ's other efforts to recover overdue fines.

In this trial we found rates of any payment were higher than rates of Any arrangement

In previous trials we have usually seen higher rates of any arrangement than any payment, presumably because people find it more alluring to set up an arrangement to pay than make a direct payment. However, in this trial we observed the opposite trend for each of the treatment groups. Overall, rates of Any payment behaviour are also lower in this trial than similar trials that use letters (such as reminder letters and Deputy Registrar summons letters), which indicates it would be worthwhile to run a trial that compares different reminder methods.

The best performing message was the Standard Message

The Standard Message is clearly superior to the other two text-message reminders we trialled. This finding is consistent with previous research that concludes a text-message's reminder function is often enough to drive behaviour and additional motivational content does not make a noticeable difference. However, our results are novel in that the behaviourally informed text-message reminders (Social Norm Message and Fairness Message) performed significantly poorer than the Standard Message, while still being significantly more effective than no text-message reminder.

This finding suggests that not only do people's rates of any payment behaviour increase when a text message reminds them about their fine, but also that the content of the text message is significant. The difference in effectiveness between the three types of text-message reminders may be because the Standard Message does not mention a fine. This ambiguity, along with mentioning that the message is from MoJ, may cause people to interpret the reason for the text message as being more significant than an overdue fine. We expected that adding more detailed information to the text-message reminder (such as a specific call to action) would increase rates of any payment behaviour, as it would reduce confusion that people may experience if they did not understand why they had received a text message. As it turns out, the opposite may be true.

A person's attitude towards paying fines is also likely to be an important factor in whether a text-message reminder is successful. Paying a fine is a distinctly negative experience and, when offered a chance to pay it, some people will choose to avoid it. When people receive the Standard Message, the chance to avoid or ignore paying their fine is less obvious. Recent research supports this hypothesis. It shows that, when people who owe fines already have negative emotions (such as guilt or shame) or feel overwhelmed about the debt, receiving additional messages about the debt



act as stressors rather than helpful reminders; they increase the likelihood that people will avoid paying the debt.¹⁹ This is an important consideration given what we know about how people's decision-making is affected when they have scarce resources. We could assume that people living in situations of scarcity would benefit from reminders, but they may only compound the problem.

There is a big difference between the Standard Message and the other text-message reminders, so it makes sense to consider the potential impact of ambiguity in other communication mediums. This is particularly relevant to Collections, given it is trying to influence fine-payment behaviour that people perceive to have negative consequences and be unimportant.

Recommendations

Based on the findings of this trial, we recommend that Collections implements these actions:

5. Continue sending the Standard Message

The Standard Message has a significantly greater effect on any payment behaviour than sending no text-message reminder, or sending the Social Norm Message or Fairness Message. Therefore, we recommend using the Standard Message as standard practice, and exploring how to use text-message reminders more systematically to collect fines.

6. Test variations to the content, timing and frequency of text-message reminders

While the Standard Message performed the best, of the three text messages we trialled, we expect there is room to improve text-message reminders. Potential improvements could be gained by varying the content, frequency or timing of the text message.

Although timing did not make a difference in this trial, the times we sent text messages were relatively close together. It could be worthwhile investigating bigger time differences (such as morning versus evening) or sending messages before a fine becomes overdue.

In this trial we sent only one text-message reminder. It could also be worthwhile investigating if more frequent messages make any difference and exploring text-message reminders alongside other Collections messaging and fine-repayment activities.

7. Test different communication methods

This trial did not compare the effects that text messages have on payment behaviour with the effects of other reminder methods. However, superficially, it appears that the rate of any payment behaviour is lower in this trial than in previous trials. A future trial could simultaneously compare text messages with other methods, such as email and letters, to see which method is most effective and for which groups of people.

8. Test the effects of ambiguous content in other communication methods

One explanation for this trial's results is that the content in the Standard Message is ambiguous. It is possible that ambiguity could be effective in other communication methods, such as emails and letters. One way to test this would be removing the MoJ logo from envelopes containing reminder letters (in other words, if people already know an envelope contains letter about their fine they may avoid opening it).

¹⁹ Custers, A., & Stephen, T. A. (2019). Message not received? The effects of creditor messaging and pressure on consumer debt management. *Saïd Business School – Research Papers*.



Appendix 1 — literature review

Effects of text-message reminders

Electronic messages can influence civic engagement²⁰ and a wide range of behaviours in multiple contexts including education, health,^{21, 22} finance²³ and justice. A popular use of text messages is to increase compliance or adherence.²⁴ Most evidence comes from the health sector, on behaviours like turning up to appointments or taking medication. However, text messages are also used in the justice sector, to remind people to turn up for court appearances (MoJ already offers this service),²⁵ and international examples suggest this is an effective practice^{26, 27, 28}.

A trial in the UK by the Behavioural Insights Team finds text-message reminders significantly increase the amount of unpaid fines that people pay off within a week of receiving the reminder.²⁹ That trial compares the average amounts paid by people who receive five different messages: a standard text message (this message does not include their name or the amount they owe); a text message that includes their name; a text message that specifies the amount they owe; a combined text message (this message includes their name and the amount they owe); and no text message (Control group). The results show that, overall, people who receive a text message pay more than those who do not; and that including a person's name is the most effective element in the text message.

An RCT in Uganda tests whether text-message reminders increase loan repayments.³⁰ The trial design compares a text-message reminder to two financial incentives: a lump-sum cash reward paid when the loan is completed; and a 25% reduction on the interest rate of a subsequent loan. The results suggest that each of three conditions lead to a 7 to 9% increase in the probability that a person will pay on time. This highlights that a simple text-message reminder

²⁰ Dale, A. & Strauss, A. (2009). Don't forget to vote: text message reminders as a mobilization tool. *American Journal of Political Science* 53, 787–804. <https://doi.org/10.1111/j.1540-5907.2009.00401.x>

²¹ Heron, K. E & Smyth, J. M. (2010). Ecological momentary interventions: incorporating mobile technology into psychosocial and health behaviour treatments. *British Journal of Health Psychology*, 15(Pt 1), 1–39. <https://doi.org/10.1348/135910709x466063>

²² Guroi-Urganci, I., de Jongh, T., Vodopivec-Jamsek, V., Atun, R., & Car, J. (2013). Mobile phone messaging reminders for attendance at healthcare appointments. *Cochrane Database of Systematic Reviews*, 12. <https://doi.org/10.1002/14651858.CD007458.pub3>; Robotham, D., Satkunanathan, S., Reynolds, J., Stahl, D. & Wykes, T. (2016). Using digital notifications to improve attendance in clinic: systematic review and meta-analysis. *BMJ Open*, 6:e012116. <https://doi:10.1136/bmjopen-2016-012116>

²³ Karlan, D., McConnell, M., Mullainathan, S., & Zinman, J. (2010). Getting to the top of mind: how reminders increase saving. *Discussion Papers*, 996. Retrieved from: <https://elischolar.library.yale.edu/egcenter-discussion-paper-series/996>

²⁴ Head, K. J., Noar, S. M., Iannarino, N. T., & Harrington, N. G. (2013). Efficacy of text messaging-based interventions for health promotion: a meta-analysis. *Social Science & Medicine*, 97, 41–8. <https://doi.org/10.1016/j.socscimed.2013.08.003>

²⁵ This service is provided on a voluntary basis; people sign up online to receive text-message reminders.

²⁶ Bernal, D. (2017). Taking the court to the people: real-world solutions for nonappearance. *Arizona Law Review*, 59(2), 547–571.

²⁷ Nice, M. (2006). *Court Appearance Notification System: Process and Outcome Evaluation. A Report for the Local Public Safety Coordinating Council and The CANS Oversight Committee*. Report #002–06. Multnomah County, Oregon. Retrieved from: https://multco-web7-psh-files-usw2.s3-us-west-2.amazonaws.com/s3fs-public/budget/documents/12_cans.pdf

²⁸ NSW Government. (2018). *The Behavioural Insights Unit Report*. Retrieved from: <https://www.dpc.nsw.gov.au/assets/dpc-nsw-gov-au/files/Behavioural-Insights-Unit/files/67b0800ebf/2018-Behavioural-Insights-Report.pdf>

²⁹ Haynes, L. C., Green, D. P., Gallagher, R., John, P., & Torgerson, D. J. (2013). Collection of delinquent fines: an adaptive randomized trial to assess the effectiveness of alternative text messages. *Journal of Policy Analysis and Management*, 32(4), 718–730. <https://doi.org/10.1002/pam.21717>

³⁰ Cadena, X., & Schoar, A. (2011). Remembering to pay: reminders vs. financial incentives for loan payments. *National Bureau of Economic Research Working Paper* 17020. <https://doi.org/10.3386/w17020>



can have a similar influence on behaviour as a substantial financial incentive does. However, an RCT on text-message reminders in The Philippines shows simply receiving a text message has no overall effect on loan repayments.³¹

Findings from New Zealand research

During the 2016 local government election in Auckland, the New Zealand Electoral Commission conducted an RCT of text-message reminders to establish their effect on increasing voter turnout. The Commission finds that people who receive a text message on election day are 4.7 percentage points more likely to vote than those who do not (75.5% versus 70.8% respectively). The reminders have more effect on people who live in a sparsely populated area, people who are recently enrolled to vote, and people who live in an area with a high percentage of Māori residents.³²

New Zealand's Inland Revenue Department offers people a service to prompt them to complete various tax-related behaviours,³³ but it is unclear whether the effectiveness of this service has been evaluated. We also have early results from a trial, by BSA and the Department of Corrections, of using text messages to remind people to attend community work. The trial finds that while the messages are well received, they do not have a meaningful effect on long-term attendance rates. This finding suggests that text-message reminders may work for one-off behaviours, but be less effective at changing behaviour in the long-term.

Factors affecting text-message reminders

The evidence that text-message reminders can be effective at prompting behaviour is anecdotally supported by Collections, which has been using text messages, on an ad-hoc basis, to increase calls to its contact centres. The extent to which other factors about text messages — such as content (what the messages should say), timing (best times to send them) and frequency (how often to send them) — influence their effectiveness is unclear.

A meta-analysis of studies of text-message reminders, for various types of appointments in healthcare settings, identifies factors that could decrease the effectiveness of messages.³⁴ These include the receiver not understanding the reminder, the reminder being poorly timed, and the message not being tailored to high-risk groups.

Message content

Research on changing the content of text messages reaches various conclusions; its effectiveness appears to be highly dependent on context. For example, personalising text-message reminders is commonly cited (in areas including treatment adherence, physical exercise and smoking cessation) as a factor that makes them more effective.³⁵ A UK trial by the Behavioural Insights Team finds messages that include recipients' first names are

³¹ Karlan, D., Morten, M., & Zinman, J. (2016). A personal touch in text messaging can improve microloan repayment. *Behavioral Science & Policy*, 1(2), pp. 25–31.

³² Williams, M., Allpress, J., & Rootham, E. (2018). *Increasing Voter Turnout Using Behavioural Insights*. Technical report 201/006. Auckland Council. Retrieved from: <https://dpmc.govt.nz/sites/default/files/2019-02/TR2018%20006%20Increasing%20voter%20turnout%20using%20behavioural%20insights.pdf>

³³ <https://www.ird.govt.nz/news-updates/tax-refund-txt-msg.html>

³⁴ McLean, S. M., Booth, A., Gee, M., Salway, S., Cobb, M., Bhanbhro, S., & Nancarrow, S. A. (2016). Appointment reminder systems are effective but not optimal: results of a systematic review and evidence synthesis employing realist principles. *Patient Preference Adherence*, 10, 479–99. <https://doi.org/10.2147/PPA.S93046>

³⁵ Ibid.



especially effective at increasing the likelihood they will pay their unpaid fines.³⁶ A UK employment trial shows that adding the receiver's name to a text-message reminder about a job fair increases the likelihood of their attendance from 10.5% to 14.8%. Personalising the message even more by adding the sender's name increases the likelihood of their attendance to 17.4%.³⁷ Evoking a sense of reciprocity in the message, by emphasising that the sender has already made an effort on the receiver's behalf, has also been shown to be effective. In one study on increasing attendance at recruitment events, the message, 'I've booked you a place, good luck!' is the most effective, leading to an attendance rate of 26.8%.³⁸ However, a meta-analysis of studies in health contexts finds no significant difference in the effects of more personalised messages (for example, messages that include the recipient's name or messaged tailored to their gender) compared with standard pre-formatted messages.³⁹

A US study using text-message reminders finds that including the consequences of not attending court, plus prompting people to plan how to get to court, is more effective than including only one or other of those elements. Receiving any of the reminders decreases 'failures to attend' (FTA) by 21%, but messages combining consequences and planning are more effective; they decrease FTA by 26% (from 38% to 28%). The messages also lead to fewer open warrants.⁴⁰

Adding statements to text-message reminders that target people's motivation may also influence their behaviour. In reminder trials that use non-electronic communication methods, social norm statements are consistently effective.⁴¹ Social norm statements work by highlighting the behaviour of most people in a group that the recipient will identify with; they rely on many people's desire to conform with others. Research has demonstrated that social norm are effective in multiple situations, including increasing payment of unpaid fines in New Zealand.⁴²

Another important consideration is how the receiver perceives the behaviour that the message reminds them to do. Many studies of reminder messages (for example, to attend school or medical appointments, or to adhere with treatment) focus on a behaviour that has, at least theoretically, a positive and beneficial outcome for the receiver. This perception of the outcome may influence whether reminders are successful,⁴³ which has implications on how to frame the content of the message.

The *Public Perceptions of Crime 2016 — Survey Report*³⁴ provides relevant, but conflicting, insights on New Zealanders' views about fines:

³⁶ Haynes et al. (2013). Op. cit.

³⁷ Briscese, G., & Tan, C. (2018). *Applying Behavioural Insights to Labour Markets: How Behavioural Insights Can Improve Employment Policies And Programmes*. The Behavioural Insights Team. Retrieved from: <https://www.bi.team/wp-content/uploads/2018/11/TheBehaviouralInsightsTeam-LabourMarketsReport.pdf>

³⁸ Sanders, M., & Kirkman, E. (2014). *I've Booked You a Place. Good Luck: A Field Experiment Applying Behavioural Science to Improve Attendance at High-impact Recruitment Events*. Working Paper No. 14/334. The Centre for Market and Public Organisation, Bristol, UK. Retrieved from: <http://www.bristol.ac.uk/media-library/sites/cmpo/documents/WebVersion.pdf>

³⁹ Orr, J. A., & King, R. J. (2015). Mobile phone SMS messages can enhance healthy behaviour: a meta-analysis of randomised controlled trials. *Health Psychology Review*, 9(4), 397–416. <https://doi.org/10.1080/17437199.2015.1022847>

⁴⁰ Cooke, B., Diop, B. Z., Fishbane, A., Hayes, J., Ouss, A., & Shah, A. (2018). *Using Behavioral Science to Improve Criminal Justice Outcomes: Preventing Failures to Appear in Court*. Ideas42 & University of Chicago Crime Lab. Retrieved from: <https://www.courthousenews.com/wp-content/uploads/2018/01/crim-just-report.pdf>

⁴¹ Hallsworth, M., List, J. A., Metcalfe, R. D., & Vlaev, I. (2014). The behavioralist as tax collector: using natural field experiments to enhance tax compliance. *NBER Working Paper Series*, 200007. National Bureau of Economic Research. Retrieved from: https://www.nber.org/system/files/working_papers/w20007/w20007.pdf

⁴² Behavioural Science Aotearoa. (n.d.). *Text-message Reminders to Increase Timely Fine Payments*. Awaiting publication.

⁴³ McLean, S., Gee, M., Booth, A., Salway, S., Nancarrow, S., Cobb, M., & Bhanbhro, S. (2014). *Targeting the Use of Reminders and Notifications for Uptake by Populations (TURNUP): A Systematic Review and Evidence Synthesis*, Chapter 4, Results. Southampton (UK): NIHR Journals Library.

- Only 34% of people agree that 'fines are an appropriate way to hold people to account for their actions',⁴⁴ while 45% disagree and 27% neither agree nor disagree. This suggests that people's views are divided on whether fines are a legitimate punishment, although people who have had some contact with the criminal-justice system in the past two years are significantly more likely to disagree. We do not have the data to know whether this finding relates to whether or not someone has received a fine.
- More than half (56%) agree that 'offenders often get away without paying court fines'.⁴⁶ This may suggest that people see others not paying their fines as a problem, and that enforcement is not as effective as it could be. Interestingly, in 2014 more people (62%) agreed with this statement, which could indicate people are becoming increasingly confident that fines are being enforced.⁴⁷

The findings from research on message framing are inconclusive. Most research looks at framing the outcome as something the recipient can get (gain frame) or something they can lose (loss frame). For example, in a study to encourage dental hygiene, a gain-framed message (a message that emphasises the benefits of dental hygiene) is more effective than a loss-framed message (a message that highlights the negative consequences of not maintaining dental hygiene).⁴⁸ Another trial, which uses text messages to remind people to submit income reports for government benefits, concludes the outcomes from gain-framing versus loss-framing message are no different compared with plain reminder messages.⁴⁹ This highlights the importance of context. We cannot expect people will react positively to being reminded they have an unpaid fine, or that any motivational message will improve their likelihood to pay. This makes it important to consider the tone of the text-message reminder, and the language we use to frame the message.

Finally, it is also worth considering the effect of abbreviations and SMS language, especially given changes to text communication due to the popularity of smartphones (for example, text messages are no longer limited to 160 characters). Evidence about the impact of using SMS language is mixed. One concern is that some people cannot understand text messages and unfamiliar abbreviations;⁵⁰ however, we have not found any research on the impact of SMS language on behaviour.

Message timing and consistency

While there does not appear to be a consensus on the most effective timing and frequency of text messages, one meta-analysis concludes that more frequent text messages have a significant moderating effect on a range of health

⁴⁴ Binnie, I. (2016). Public Perceptions of Crime 2016 — Survey Report. Colmar Brunton: New Zealand. Retrieved from: <https://www.justice.govt.nz/assets/Documents/Publications/20161130-Final-PPS-report.pdf>, p. 48.

⁴⁶ Ibid, p. 8.

⁴⁷ Ministry of Justice, (2014). Public Perceptions of Crime 2014 — Survey Report. Colmar Brunton: New Zealand. Retrieved from: https://thehub.swa.govt.nz/assets/documents/42832_public-perceptions-of-crime-survey-201412_o.pdf

⁴⁸ McLean et al. (2014). Op. cit.

⁴⁹ Behavioural Economics Team of the Australian Government. (2017). *Effective Use of SMS: Timely Reminders to Report On Time*. Australian Government. Retrieved from: <https://behaviouraleconomics.pmc.gov.au/sites/default/files/projects/sms-timely-reminders.pdf>

⁵⁰ Ali, J. K. M., Hasnain, S. I., & Beg, M. S. (2015). The impact of texting on comprehension. *International Journal of Applied Linguistics and English Literature*, 4(4), 108–117. <http://dx.doi.org/10.7575/aiac.ijalel.v.4n.4p.108>



behaviours.⁵¹ The most appropriate configuration is likely to depend on the context, and on how important the recipient perceives the event or action that they are being reminded about.⁵²

When people receive a text message (such as morning or evening) may affect their likelihood to react. A Kenyan study of text-message reminders about loan repayments concludes messages are more effective when they are received in the evening.⁵³

⁵¹Skinner, R., Gonet, V., Currie, S., Hoddinott, P., & Dombrowski, S. U. (2020). A systematic review with meta-analyses of text message-delivered behaviour change interventions for weight loss and weight loss maintenance. *Obesity Reviews*, 21(6), e12999.

⁵² Schwebel, F., & Larimer, M. (2018). Using text message reminders in health care services: a narrative literature review. *Internet Interventions*, 13, 82–104. <https://doi.org/10.1016/j.invent.2018.06.002>

⁵³ Karlan, D., Morten, M., & Zinman, J. (2016). A personal touch in text messaging can improve microloan repayment. *Behavioral Science & Policy*, 1(2), pp. 31–39.



Appendix 2 — gender and age breakdown

Table 4. Gender of participants in the Control and Treatment groups

Group	Male	Female	Unknown	Total
Control group	9,435	4,700	882	15,017
Treatment group 1: Standard Message	3,155	1,601	299	5,055
Treatment group 2: Social Norm Message	3,226	1,585	289	5,100
Treatment group 3: Fairness Message	3,220	1,511	306	5,037
Sub-total of treatment groups	9,601	4,697	894	15,192
Total participants	19,036	9,397	1,776	30,209

Table 5. Age of participants in the Control and Treatment groups

Group	≤ 19	20–29	30–39	40–49	50–59	60–69	Unknown	Total
Control group	425	5,105	4,499	2,638	1,687	617	46	15,017
Treatment group 1: Standard Message	136	1,769	1,448	861	587	242	12	5,055
Treatment group 2: Social Norm Message	100	1,655	1,580	915	610	225	15	5,100
Treatment group 3: Fairness Message	134	1,690	1,589	817	581	218	8	5,037
Sub-total of treatment groups	370	5,114	4,617	2,593	1,778	685	35	15,192
Total participants	795	10,219	9,116	5,231	3,465	1,302	81	30,209



Appendix 3 — text-message schedule

Table 6. Days and times for sending each type of text message

Day	Time	Treatment group/message	Day	Time	Treatment group/message
1	10 am	1 Standard	11	10 am	3 Fairness
1	12 pm	2 Social Norm	11	12 pm	2 Social Norm
1	2 pm	3 Fairness	11	2 pm	1 Standard
2	10 am	3 Fairness	12	10 am	1 Standard
2	12 pm	1 Standard	12	12 pm	2 Social Norm
2	2 pm	2 Social Norm	12	2 pm	3 Fairness
3	10 am	2 Social Norm	13	10 am	3 Fairness
3	12 pm	3 Fairness	13	12 pm	1 Standard
3	2 pm	1 Standard	13	2 pm	2 Social Norm
4	10 am	2 Social Norm	14	10 am	2 Social Norm
4	12 pm	1 Standard	14	12 pm	3 Fairness
4	2 pm	3 Fairness	14	2 pm	1 Standard
5	10 am	1 Standard	15	10 am	2 Social Norm
5	12 pm	3 Fairness	15	12 pm	1 Standard
5	2 pm	2 Social Norm	15	2 pm	3 Fairness
6	10 am	3 Fairness	16	10 am	2 Social Norm
6	12 pm	2 Social Norm	16	12.00 pm	3 Fairness
6	2 pm	1 Standard	16	2.00 pm	1 Standard
7	10 am	1 Standard	17	10 am	3 Fairness
7	12 pm	2 Social Norm	17	12 pm	2 Social Norm
7	2 pm	3 Fairness	17	2 pm	1 Standard
8	10 am	3 Fairness	18	10 am	1 Standard
8	12 pm	1 Standard	18	12 pm	2 Social Norm
8	2 pm	2 Social Norm	18	2 pm	3 Fairness
9	10 am	2 Social Norm	19	10 am	3 Fairness
9	12 pm	3 Fairness	19	12 pm	1 Standard
9	2 pm	1 Standard	19	2 pm	2 Social Norm
10	10.00 am	2 Social Norm	20	10.00 am	2 Social Norm
10	12.00 pm	1 Standard	20	12.00 pm	3 Fairness
10	2.00 pm	3 Fairness	20	2.00 pm	1 Standard



Appendix 4 — financial breakdown

Group	Number of people	Total owed (NZD)	Average owed (NZD)	Total paid (NZD)	Average paid (for those who paid any amount)	Amount paid per text message/person	Total remitted (NZD)	Total paid or remitted (NZD)	% of total owed that is paid or remitted
Within 14 days of text-message reminder									
Control group	15,017	\$20,517,598.39	\$1,366.29	\$193,834.35	\$71.05	\$12.91	\$134,266.20	\$328,100.55	1.60%
Treatment group 1: Standard Message	5,055	\$6,794,431.16	\$1,344.10	\$92,194.32	\$76.07	\$18.24	\$68,446.35	\$160,551.23	2.36%
Treatment group 2: Social Norm Message	5,100	\$7,218,900.72	\$1,415.47	\$94,104.88	\$81.55	\$18.45	\$33,142.57	\$127,247.45	1.76%
Treatment group 3: Fairness Message	5,037	\$6,756,705.34	\$1,341.41	\$78,031.89	\$74.53	\$15.49	\$47,816.61	\$125,848.50	1.86%
Sub-total of treatment groups	15,192	\$20,770,037.22	\$1,367.00	\$264,331.09	\$77.38	\$17.40	\$149,405.53	\$403,647.18	1.94%
Total participants	30,209	\$41,287,635.61	\$1,366.82	\$458,165.94	\$75.80	\$14.20	\$283,671.73	\$731,747.73	1.77%

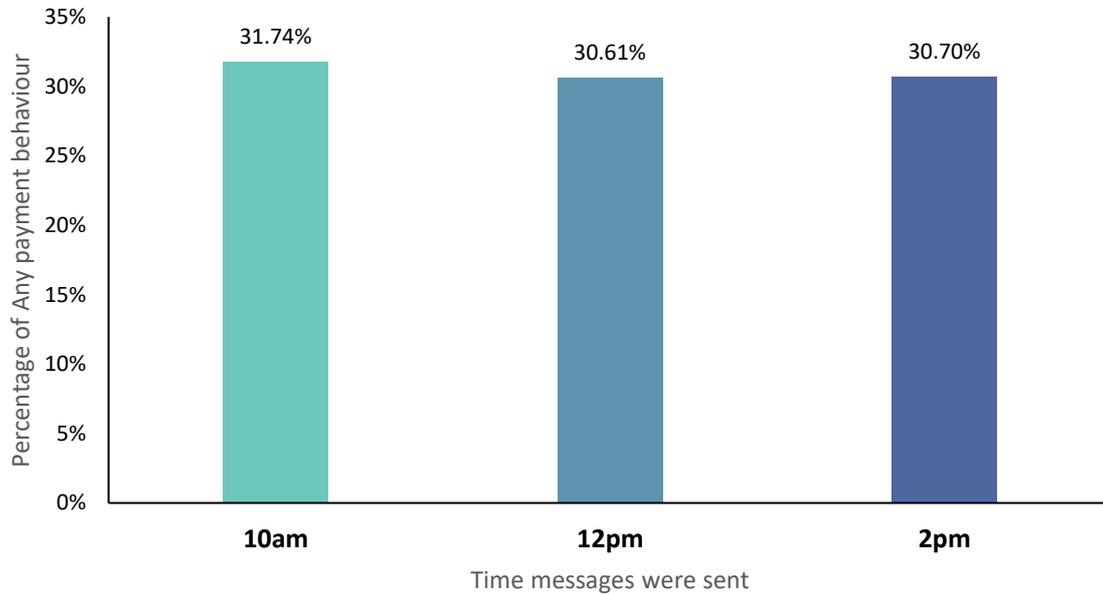
These figures are based on the numbers included in the final analysis.



Appendix 5 — analysis of timing

Our analysis shows that there are no significant differences in any payment behaviour between people who receive their text-message reminder at 10 am, 12 pm or 2 pm (see Figure 6).

Figure 6: Rates of any payment behaviour within 14 days of text-message reminder, by time of text-message reminder — all treatment groups



There are also no significant differences in any payment behaviour between people who receive their text-message reminders on different days of the week (see Figure 7).

Figure 7: Rates of any payment behaviour within 14 days of text-message reminder, by day of text-message reminder — all treatment groups

