

USING BEHAVIOR SCIENCE TO MINIMIZE COMMERCIAL WATER LOSSES: EVIDENCE FROM A SMS EXPERIMENT WITH A PUBLIC UTILITY COMPANY IN BRAZIL

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ABSTRACT

Water scarcity remains common in Brazil. High levels of non-revenue water—which occur when high volumes of water produced do not generate revenue for the supplier—is also a challenge. Losses may be due to structural and operational inefficiencies, but clients also play a key role by defaulting on their water payments or installing bypasses to consume water free of charge, triggering significant and detrimental impact for water utility companies. This study tests the use of behaviorally-informed SMSs to reduce commercial water losses. Approximately 211,000 residential clients randomly received one of five different messages encouraging them to pay their water bill. The control group did not receive a reminder. The behaviorally informed SMS messages increased on-time payment rates and total amount paid. The most effective messages were the reciprocity and deterrence SMS. The intervention has potential to generate significant dividends at a low cost.

Keywords: water bills; default payments; behavioral science; nudges; behaviorally informed SMS

INTRODUCTION

State water and sanitation companies in Brazil account for 75 percent of the service delivery market in Brazil, but suffer from significant water losses with an average of 38 percent non-revenue water (World Bank, 2016). While some losses are due to structural and operational inefficiencies such as leaky pipes, clients behavior also plays a key role: by defaulting on their water payments or installing bypasses to consume water free of charge, clients also contribute to water losses.

Behavioral science can offer innovative solutions to this problem by focusing on the social, psychological, and economic factors that affect what people think and do. Growing evidence shows that by addressing details in service delivery and technologies, that are often overlooked by standard solutions, behavioral science can dramatically improve the effectiveness of projects. With this in mind, the World Bank's Water Global Practice and Mind, Behavior, and Development (eMBed) teams, with financing from the United Kingdom Prosperity Fund, partnered with a public utility company in Brazil to run a pioneer study testing behavioral science solutions to reduce commercial water losses. Briefly, results showed that a short-term, low-cost SMS intervention has potential to increase on-time bill payment rates resulting in an increase in the utility's revenues as further detailed below.

MATERIAL AND METHODS:

The study encompassed a randomized controlled trial (RCT), in which a sub-set of almost 211,000 residential clients from the public utility were randomly assigned to one of five treatment groups or a control group. Clients in treatment groups received a SMS reminder before their due date with one of five different messages encouraging them to pay their water bill. The control group did not receive a reminder. By using

a RCT – whereby the sample of participants is randomly dividing into different groups, i.e. a control (i.e. “business as usual”) and one or more treatments (i.e. solutions) – the study was able to reliably and rigorously evaluate the impact of solutions tested.

The five SMS reminders consisted of a standard message (i.e. utility’s standard bill notification), and four messages informed by behavioral science. Specifically: reciprocity (the utility works hard to bring water to their family), deterrence (water could be cut if they fail to pay), descriptive norm (the majority pays on time), and seasonal (e.g. start 2020 debt free). The behavioral messages were built based on insights from a previous behavioral diagnostic, which was carried out by eMBed with clients from the utility company to identify key bottlenecks for payment.

The study run for three months, from November 2019 to January 2020, and SMS reminders were sent each month. Results showed that (i) clients that received any of the four behaviorally informed SMS were more likely to pay on time than clients that did not receive a message; (ii) total amount paid also increased for both the deterrence and reciprocity SMS; and (iii) altogether, the most effective messages were the reciprocity and deterrence SMS, with both showing statistically significant increases on the on-time payment rate and total amount paid.

RESULTS AND DISCUSSION

To illustrate, compared to those that did not receive an SMS, results indicated that for every 1,000 clients that received the SMS message, 11 additional clients paid on-time. Further, the reciprocity SMS led to an average increase of R\$1.7 (US\$ 0.30) per bill paid at an average cost of R\$0.04 (US\$ 0.007) per message. When extrapolating the on-time payment rate findings of the reciprocity message to the larger population of clients of the public utility who default on their water bills, an estimated additional 6,400 households per month would pay their bills on time should these results persist.

CONCLUSION

This pioneer collaboration with a public utility company in Brazil demonstrates the potential for increasing water bill payments in a cost-effective and non-complex manner and by leveraging existing tools (i.e. SMS messages by the public utility). It shows that adapting client communications with a behavioral lens can produce considerable gains, and provides opportunities for public utility companies – within Brazil or elsewhere – to use a similar approach to test effective reminders to increase bill payment.

REFERENCES

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