The Impact of Mobile Money on the Purchase of Improved Sanitation Services in Senegal

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Sector(s): Finance, Health

Sample: 3,757 households

Target group: Urban population Adults Families and households

Outcome of interest: Technology adoption Savings/deposits Take-up of program/social service/healthy behavior

Intervention type: Commitment devices Digital and mobile Nudges and reminders Preventive health Subsidies Water, sanitation, and hygiene

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Partner organization(s): Senegal Office of Sanitation (ONAS), Water and Sanitation for Africa, Gates Foundation

The proliferation of mobile money across low- and middle-income countries has led to increased availability of mobile payment systems, which can potentially allow more flexible payment terms for customers. Researchers conducted a randomized evaluation to test whether subsidies, deposit requirements, and access to a mobile money savings vehicle increased the likelihood that households purchased an improved but more expensive sanitation service (i.e., mechanized desludging). Subsidies increased the take-up and purchase of mechanized desludgings, while interventions inspired by mental accounting such as deposit requirements and earmarked savings accounts did not. The flexibility of being able to save in advance increased take-up of mechanized desludgings through the program but did not affect overall take-up more generally–simply leading households who would have purchased the more sanitary technology to purchase it from the program rather than on the open market.

Policy issue

Low demand for health-enhancing products and services, such as improved sanitation services, imposes substantial welfare costs on communities because health and sanitation goods affect individuals beyond those who are making the purchase decision. While it has been widely shown that large subsidies can increase take-up of health-enhancing goods, subsidy programs are expensive.

Increasing take-up of health-enhancing goods through less expensive means such as expanding payment options via mobile money could improve welfare at a lower cost. For example, allowing people to make partial payments in advance in earmarked accounts, or forcing them to do so by requiring pre-paid deposits, could increase purchases of health-enhancing products and services. This is both because having an account gives people a place to save money and because the earmarking and mandatory deposit encourages “mental accounting,” or the idea that people mentally maintain separate spending categories and only allow

themselves to make a purchase when they have available funds targeted in that category.

How do the impacts of mental accounting nudges compare to the impact of subsidies in increasing the take-up of sanitation products in Dakar?

Context of the evaluation

Almost two million people in urban Dakar outside the city center use latrines that are not connected to the city's sewage network. These pits fill up approximately once every six months and then need to be emptied, or "desludged," for continued use. When the latrine pit is full, households have two options: manual or mechanized desludging. Many households choose manual desludging, the less sanitary option, due to the high cost of mechanized desludging, which has an average price of US$50. Fifty-six percent of study households chose the manual option for their most recent desludging before the baseline, at an average price of US$29.

Wari is the largest mobile money service provider in Dakar, with 97 percent of study participants reporting that they knew of Wari and 86 percent stating that they had used Wari in the past. As of July 2014, Wari controlled 80 percent of the market for mobile money transfers in Senegal with an average of 125,000 daily remittances. Transactions are made through the 3,000 Wari stations, typically located in corner shops. Wari was interested in expanding their financial services and created Wari mobile savings accounts for the purposes of this evaluation. These accounts allowed study participants to save money dedicated for the sanitation service.



Children wash their hands in front of community latrines.

Photo credit: Ivan Bruno de M, Shutterstock.com

Details of the intervention

Researchers conducted a randomized evaluation to test whether subsidies, deposit requirements, and access to a mobile money savings vehicle increased the propensity of households to purchase a mechanized desludging, an improved but more expensive sanitation service.

In the areas of Dakar most affected by manual desludging, where the sanitation network does not extend, researchers offered 3,757 households a subscription for mechanized desludging, which gave households access to up to two discounted mechanized desludgings over a period of twelve months. Among these households, researchers randomized the subsidy level and the deposit requirement:

- Half of households were offered a price of US$48, which was close to the price the household would pay on the open market for mechanized desludging (US$50). The other half of households were offered a price of US$34, which was close to the average cost of a manual desludging not conducted by a family member (US$29).
- All households received a US$6 payment for participation in a survey conducted by researchers. Of these, 87 percent were randomly required to leave this in their Wari account as a deposit if they signed up for a subscription. If they still had not used their subscription by the end of the twelve months, they were given access to their original US$6 deposit and any funds saved in the account. The other 13 percent could sign up for the subscription with no commitment on their part.

Subscribing households could call a call center when they had saved enough in their mobile money account and wanted to use their subsidized desludging. Upon completion of the desludging service, the operator transferred the payment from the household's account to the desludging provider's account.

Of the 3,757 households who were offered the subscription, 1,496 enrolled. After making the enrollment decision, the households that signed up were randomized into one of three mobile money interventions: save at will, monthly billing, and pay in full.

- The save-at-will intervention gave individuals a mechanism to save by providing them with a mobile money savings account earmarked for desludging expenses. They could deposit any amount at any time.
- The monthly-billing intervention also provided individuals with a mobile money savings account earmarked for desludging expenses. Individuals were asked to make consistent partial payments each month and were told a recommended amount to deposit, though they could deposit any amount at any time.
- The pay-in-full intervention was closest to the current status quo, requiring the individual to pay in one installment. They could deposit that amount at any time, and the mobile money system prevented them from depositing less than the full price. This group served as the comparison group.

Clients paid a US$0.20 fee to deposit any amount less than US$10 and a 2 percent fee for deposits larger than that. There were no fees for withdrawals or transfers to desludging operators.

Researchers conducted a baseline survey in which they offered the subscription to households between February and May 2014 and an endline survey between March and May 2015. Researchers relied on administrative data for mobile money account usage and purchases of the subsidized mechanized desludging subscription for all households. The second survey conducted in 2015 collected details on purchases of unsubsidized mechanized desludgings on the open market as well as purchases of any mechanized desludgings (either subsidized or unsubsidized).

Results and policy lessons

Subsidies increased the use of mechanized desludgings, while pre-paid deposit requirements had no impact on their use. The flexibility of being able to save in advance in an earmarked savings account through the save-at-will intervention increased take-

up through the program, but did so at the expense of take-up outside the program.

Take-up of subscription: Being offered the larger subsidy increased the likelihood that an individual signed up by 20 percentage points, or a 51 percent increase from the mean subscription rate of 40 percent. This translated into an 8 percentage point higher likelihood of purchasing a subsidized desludging through the program, a 6 percentage point lower likelihood of purchasing an unsubsidized desludging on the open market, and a 3 percentage point higher likelihood of purchasing a mechanized desludging overall. These findings suggest that subsidies for preventive health products increase their take-up.

Having to leave a deposit discouraged people from signing up. However, it appeared to mostly discourage those who were not going to purchase the subsidized desludging anyway, since it had no impact on purchases.

Purchasing behavior: Among those that subscribed to the program, the save-at-will intervention increased the probability of purchasing the subsidized mechanized desludging by 5 percentage points, or a 26 percent increase from the mean of 19 percent. These effects were particularly large for households in which the person making the decision did not have a consistent monthly salary. The monthly-billing intervention had no impact on the probability of purchasing the subsidized mechanized desludging.

The mobile money interventions did not seem to induce people to switch from manual to mechanized desludgings. The save-at-will intervention caused a decrease in the purchase of unsubsidized mechanized desludgings on the open market commensurate with the increase in purchases of subsidized mechanized desludgings through the program. Thus, it had no impact on overall purchases of mechanized desludgings more generally. This suggests that the save-at-will intervention induced people who were going to purchase a mechanized desludging anyway to purchase one through the program rather than on the open market. The monthly-billing intervention did not affect purchases of either unsubsidized or subsidized mechanized desludgings.

Deposit behavior: People in the save-at-will intervention group were 5 percentage points more likely to make a deposit into their Wari account, a 22 percent increase from the mean of 23 percent. Compared to the monthly-billing group, people in the save-at-will group deposited more in the form of non-final deposits. This suggests that the flexibility afforded by the save-at-will intervention allowed people to save money whenever they had extra cash on hand, making it more likely that they purchased the subsidized desludging.

Taken together, in this context, the high subsidy encouraged individuals to switch from less sanitary to more sanitary techniques. However, the mental accounting nudges were less successful: the pre-paid deposits had no effect and monthly billing had little impact on deposits and take-up of desludging. Being given access to an earmarked savings account did encourage individuals to switch away from their usual mechanized desludging provider and purchase the mechanized desludging provider through the program using the Wari account, but it did not lead people to change their desludging method (mechanized versus manual).