

Researchers

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Sample Size

8800 households in peri-urban Dakar, 150 sanitation workers

Research Implemented by IPA

Yes

Market Structuring of Sludge Management for the Benefit of Vulnerable Households in Dakar

Abstract

Poor sanitation in the developing world leads to childhood diarrhea, a leading cause of mortality in children under five.¹ This project seeks to identify ways to increase demand and reduce prices for an improved sanitation technology, mechanical desludging. Researchers are measuring the effects of social and behavioral factors (social pressure, learning, and payment formats) on household demand, and the effect of different auction mechanisms on collusion and prices paid by consumers.

Policy Issue

In urban areas of developing countries where houses are not connected to publicly-provided sewer systems, a household's waste goes into its own septic tank or unimproved pit, which then has to be emptied, or "desludged." A household can either pay to have the pits shoveled out manually, which often means dumping it near adjacent homes, posing health hazards to both workers and residents, or hire a mechanized desludger which pumps the sludge into a truck that then delivers the sludge to a treatment plant. Mechanized desludgers are more expensive, but also more sanitary. Because they are often underutilized, research is needed to better understand how to increase demand and decrease prices for these services.

Details of the Intervention

In Dakar, Senegal, waste pits fill on average every six months, but only an estimated 30 percent of households use mechanized desludging because of the expense. Estimates suggest that a mechanized desludging costs approximately five days' wages while a "baay pelle" (a worker who shovels the pit manually) costs approximately two days' wages. The Office National de l'Assainissement du Senegal (ONAS), part of the Senegalese Ministry of Sanitation, is seeking to identify ways to boost usage of the more expensive, but more sanitary, mechanized desludging.

This project seeks to understand how to increase use of mechanized desludging, from both the demand (customer) side and supply (provider) side.

Demand Side Interventions:

Four thousand households will be randomly assigned to receive a discount of either 10 or 50 percent on mechanized desludging services. To understand the extent to which social pressure influences use of mechanized desludging, this discount will be made by public lottery for half of the households, and for the other half it will be offered privately. A further 800 households will be surveyed to evaluate the effects on those nearby who were not offered subsidized mechanized desludgings.

The impacts of learning from others and coordination will be measured when 100 randomly chosen households are told either how many or specifically which of their neighbors have signed up, and are then given the opportunity to sign up. To measure learning from doing, researchers will see whether those who received subsidized services continue after the discount ends.

A number of payment structures will also be tested. Eighty percent of households will be asked to leave a deposit at the time of the survey if they would like to sign up for the subsidized mechanized desludging. One third of households will be asked to pay the remainder at the time of service, one third will be given a savings account earmarked for desludging and billed monthly, and one third will be given the same earmarked savings account, but allowed to contribute whenever they wish. Half of households will also be offered a general, non-earmarked savings account. Varying the frequency of payments and savings options will test the relative importance of commitments and mental accounting to encourage payment and usage.

Supply Side Interventions:

Anecdotal evidence suggests that desludging firms discuss prices among themselves and coordinate pricing for the different neighborhoods of the region. A new call center, developed by the researchers together with ONAS and the NGO Water and Sanitation for Africa (WSA), will handle contracting of desludging jobs for households in the study. When households are ready for desludging, they can call the center and desludging truckers will bid on their job using text messages. The new call center will allow researchers to test whether changing the auction mechanism can lower pricing for customers. Jobs will be assigned randomly to either an open auction, with the current lowest bid and firm name sent out by text message every

15 minutes, or a sealed bid format, where bidders compete anonymously. This randomization will test if either bidding strategy leads to lower prices than the current system, which involves customers negotiating individually with truckers.

This call-in center will not only be available to those households participating in the demand-side interventions; it will also be available to households across Dakar, with a geographic roll-out over time. Together with WSA, researchers are surveying an additional 4,000 households in baseline, midline, and endline surveys to estimate the impact of the roll out of the call-in center on the general unsubsidized population. These households will be far enough away from the demand-side households that they should not be affected by the subsidies offered to those households. Researchers are also surveying all 150 sanitation truckers in the Dakar area.

Results and Policy Lessons

Results forthcoming

Sources

World Health Organization. 2009. "Fact sheet N°330: Diarrhoeal disease."
<http://www.who.int/mediacentre/factsheets/fs330/en/index.html>.
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