



Chlorine Dispensers for Safe Water: Scaling for Results

Overview

- Two million children die from diarrheal diseases each year. Contaminated drinking water is a leading cause of diarrhea.
- Chlorination inactivates pathogens that cause diarrhea. Treatment of household drinking water with dilute chlorine solution can reduce child diarrhea by 20-40%.
- Dilute chlorine solutions are marketed as a consumer good used in the home.
- In many areas, only around 5% of people are willing to purchase these products at current prices, and there is evidence that price is an important barrier to take up.
- Under the current retail distribution model, packaging accounts for a large fraction of costs, with the cost of the chlorine ingredient accounting for just 5% of total product costs.
- A chlorine dispenser situated at the point of water collection is being piloted in Kenya and has been well received by communities, with a 69% take-up rate.
- Identifying how to scale up this approach could drastically alter the rural water landscape and allow more children to be saved from the scourge of diarrhea.

The Chlorine Dispenser

- Delivers chlorine at very low cost. Estimated long-run cost is about \$0.20- \$0.40 per household per year, less than 10% of costs under current approaches.
- Delivers chlorine at the point of water collection for maximum salience and convenience to users
- Leverages social learning and peer effects to build habits of water treatment and increase take up.
- Can be locally assembled using readily available materials and involves minimal maintenance.
- Can be re-filled and maintained through a sustainable supply chain based on existing institutions.

Background

Since 2002, the Kenya Rural Water Project, a collaboration between Innovations for Poverty Action (www.poverty-action.org) and researchers at Harvard University and the University of California, Berkeley, has been conducting randomized controlled trials to investigate how to provide safe drinking water to rural populations in western Kenya. Guided by these studies, RWP developed an innovative technology for providing communities with dilute chlorine using a chlorine dispenser (similar to a liquid hand soap dispenser) located at pre-existing communal water sources. The preliminary evaluation of the dispenser system (providing chlorine to 5,000 people at 20 water points) suggests that the dispenser system can achieve unprecedented take-up rates at radically lower costs than the current distribution paradigm. RWP is now seeking to refine the design to bring down costs and explore options for effective marketing, cost recovery, and sustainable scale up.

How the Chlorine Dispenser Works

The PVC dispenser tank and dosing valve are enclosed in a lockable stand that is cemented into the ground immediately next to the water source. Users dose their water container at the source, and transportation back to their homes provides contact time and agitation for optimal chlorination. A community-wide meeting is held at the time of installation to inform households about the dispenser and discuss safe and proper usage. Instructions in KiSwahili and in pictures are displayed on the dispenser. A local community member is elected to periodically refill the dispenser.



Results

Feedback from communities about dispensers has been overwhelmingly positive. Not only do 69% of study households with access to a dispenser had detectable chlorine in their drinking water during an unannounced visit (compared to only 5% of households without access to a dispenser), but the percentage of community members using the dispenser has consistently increased over time.

Scaling Up

Next steps will involve refining dispenser design and exploring strategies for cost recovery, marketing, and sustainable scale up. Key issues include assessing the feasibility of:

- Bringing down costs by stocking dispensers using pre-packaged briquettes of solid chlorine
- Marketing dispensers through water sellers, social entrepreneurs, community groups, schools, local water companies, and locally-elected councilors.

Chlorine dispensers could be a major new tool for fighting child mortality and improving global health. By providing families with cheap access to clean water, chlorine dispensers could potentially save the lives of up to half a million children each year.