

FLETCHER D-PRIZE COMPETITION

2021-2022 Academic Year

Clean Water Challenges

Distribute Community Chlorine Dispensers to Improve Water Quality

We challenge you to design a new social enterprise improving access to safe water. Right now millions lack access, but point-of-use chlorine dispensers are proven to change that. D-Prize will award up to \$20,000 to teams with a plan to launch a pilot of this work, and who have a vision to scale country-wide.

The Poverty Problem

Millions of people lack access to safe water, which is critical in preventing infectious disease like diarrhea.¹ 785 million people lack access to improved water supplies, of which 400 million are in sub-Saharan Africa.²

The health impact of this is tragic. Diarrhea kills nearly 1.6 million people every year, one-third of whom are children under the age of five.³ Among infectious disease, it ranks as the third highest cause of mortality and morbidity, above tuberculosis and malaria.⁴

According to the World Health Organization, chlorine is the most cost-effective water quality intervention to prevent diarrhea.⁵ A diluted chlorine solution disinfects water against most bacteria and protects it from recontamination.⁶ Randomized control trials have shown that chlorine treatment reduces reported child diarrhea by 29%.⁷

¹ Ibid.

² Progress on household drinking water, sanitation and hygiene 2000-2017. Special focus on inequalities. New York: United Nations Children's Fund (UNICEF) and World Health Organization (WHO), 2019. P. 26

³ Bernadeta Dadonaite, Hannah Ritchie and Max Roser (2020) - "Diarrheal diseases". Published online at OurWorldInData.org. Retrieved from: '<https://ourworldindata.org/diarrheal-diseases>' [Online Resource]

⁴ Clasen TF, Roberts IG, Rabie T, Schmidt WP, Cairncross S. Interventions to improve water quality for preventing diarrhoea. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD004794. DOI: 10.1002/14651858.CD004794.pub2.

⁵ https://www.who.int/water_sanitation_health/economic/prevent_diarrhoea.pdf, page 24

⁶ <https://www.povertyactionlab.org/case-study/community-chlorine-dispensers-better-health>

⁷ Kremer, M., Miguel, E., Mullainathan, S., Null, C., Zwane, A., 2011b. Social Engineering: Evidence From a Suite of Takeup Experiments in Kenya, p. 1

However, despite aggressive public health campaigns, adoption remains low when distributors rely on individually-packaged chlorine.⁸ In Kenya, J-PAL affiliated researchers found under 10% of households reported chlorinating their water. The researchers experimented with variations in price, marketing, and packaging of individual bottles, and found little lasting effect on chlorine adoption.⁹

The Proven Intervention

Fortunately, there is a proven solution. Chlorine dispensers *installed directly at community water sources* provide a set dose of chlorine at the source. Dispensers are typically free of charge to community members collecting water for household use.¹⁰ Dispensers may also be staffed with a paid promoter.

When combined with a paid promoter hired from within the community, point-of-collection dispensers were found to increase chlorine adoption by 53%. Two years after installation of the first dispensers, 61% of sampled households had chlorine in their water, compared to 15% in a control group, even after payments to promoters had ended.¹¹

Evidence Action's [Dispensers for Safe Water program](#) has installed more than 27,000 dispensers in Kenya, Malawi, and Uganda, reaching 4 million beneficiaries, at the cost of US\$1.28 per person per year.¹² Researchers estimate the cost per DALY saved is around \$20-30, making this an extremely cost-effective intervention.¹³

Your Distribution Challenge

D-Prize will award up to \$20,000 to teams that can create a new social enterprise that distributes point-of-use chlorine dispensers to communities without access to improved water and markets them via paid promoters from within the community.

You must have a vision to grow quickly and serve at least 100,000 beneficiaries within five years. Our award is meant to enable the first step toward this vision by supporting a small test pilot of the enterprise meant to scale.

Designing Your Social Enterprise

We believe a successful community chlorine dispenser distribution enterprise must eventually solve three key challenges. We encourage you to focus your pilot on building and testing solutions to just a few of these pieces.

⁸ Ibid.

⁹ <https://www.povertyactionlab.org/case-study/community-chlorine-dispensers-better-health>

¹⁰ Ibid.

¹¹ https://opinionator.blogs.nytimes.com/2014/05/14/peer-pressure-can-be-a-lifesaver/?_php=true&_type=blogs&r=0

¹² <https://www.povertyactionlab.org/case-study/community-chlorine-dispensers-better-health>

¹³ <https://www.poverty-action.org/sites/default/files/publications/chlorinedispensers.pdf>

(1) Distribution Model: does your dispenser service work fit with your market, without straying far from the existing proven model?

An initial challenge is building an operation that is effective at delivering chlorine. Research strongly suggests that dispensers must be located near a communal water source for user uptake to occur. However, there are other considerations to consider:

- Dispensers should fit consumer needs. For example, in Kenya, Dispensers for Safe Water's dispensers are designed to release 3mL of chlorine with every turn of a knob, which is the appropriate amount of use for the commonly-used 20L jerrycans. The dispenser tank holds 3L of dilute chlorine solution, which should last one month in a community of a few hundred people.¹⁴
- Ensuring users have received proper direction and can use dispensers is critical. As one example, Dispensers for Safe Water provides illustrated directions and text directions in a local language.
- Paid promoters are a critical component to the proven intervention. An ideal enterprise will have to make good choices on who to hire, train, and manage. For example, existing organizations found success using promoters elected by the community and paid a modest flat fee.¹⁵

A successful enterprise will build excellent operations that mimic the proven model as much as possible, with some flexibility to make changes to fit within the local context.

(2) Impact: How do you measure and prove your model is creating impact?

We are seeking pilot ideas that produce strong data supporting their impact early on. While there is strong evidence that chlorine dispensers reduce diarrhea significantly, others are skeptical because the trials relied on self-reported metrics and unblinded studies.¹⁶

The ideal D-Prize winner will have a plan to measure their work's marginal impact and be able to address any skepticism of its effect on diarrhea rates. An ideal plan will be stage appropriate (for instance, we would not support running a formal randomized control trial at the pilot stage).

(3) Scale: How will you do all of the above in a way that can scale quickly?

We believe proving that your model has significant growth potential is the most important part of this pilot. We are less concerned with the cost to reach one community member during the pilot, and more interested in a model that demonstrates potential to reach many people quickly and cheaply.

¹⁴ Kremer, 2011b. p29.

¹⁵ Ibid, p2.

¹⁶ <https://blog.givewell.org/2016/05/03/reservations-water-quality-interventions/>

As a baseline, at scale Dispensers for Safe Water reaches one beneficiary for roughly \$1.28 per year.¹⁷ This cost includes hardware, recurring chlorine refills, dispenser management, and maintenance.

A successful enterprise will also need to consider where funding for growth comes from. One idea may be to rely on grant funding. You might also consider other revenue sources. For instance, Dispensers for Safe Water is experimenting with several new avenues for funding, including domestic government financing and village-pooled funding.¹⁸

Ready To Apply?

Download a First Round Application Packet and start creating your proposal at www.fletcher.tufts.edu/D-Prize.

Questions? Email Dorothy Orszulak at dorothy.orszulak@tufts.edu.

¹⁷ <https://www.povertyactionlab.org/case-study/community-chlorine-dispensers-better-health>

¹⁸ <https://www.povertyactionlab.org/case-study/community-chlorine-dispensers-better-health>