

Chlorine Dispensers for Safe Water



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The Kenya Rural Water Project (RWP)

- Ongoing series of randomized evaluations of alternative water interventions in rural western Kenya
 - Collaboration between researchers at Harvard, Berkeley and IPA
- Studies on:
 - **Source water quality improvements through *spring protection***
 - **Point-of-use water treatment with chlorine**
 - Increased water quantity
 - Alternative water maintenance policies
- Results
 - Understanding of demand for and impact of interventions
 - New approach to water treatment – *point of collection chlorine dispensers* - that could improve health of millions

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Improving Source Water Quality

- Randomized trial of spring protection (Kremer, Leino, Miguel, Zwane; 2009)
 - 184 springs protected; sequence of protection randomized (2004-07)
- Recontamination important: Source water contamination ↓ 66%; home water contamination ↓ 24%
- Child diarrhea ↓ 25%
- Low valuation of water quality
- Convenience important for adoption



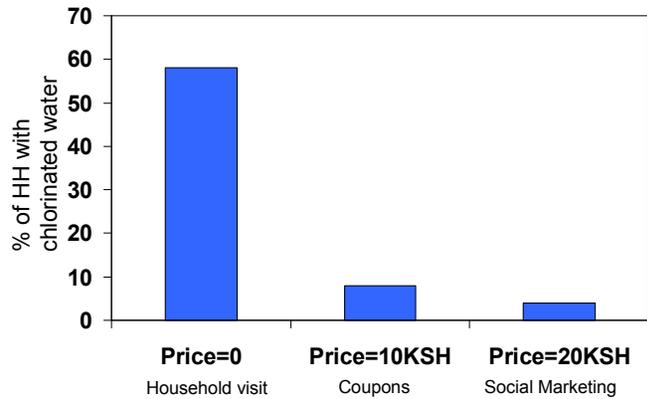
Chlorination

- Chlorination is effective, safe, cost effective
 - Most commonly used treatment in piped water
 - Reduces child diarrhea by 20-40 percent
 - Chlorine residual protects against recontamination
 - Extremely cheap
- Distribution via social marketing
 - But limited take-up
- Why?



Determinants of Adoption of Water Treatment

- Price is an important barrier to adoption



- Personal contact, community messages, information, psychological factors have some effect

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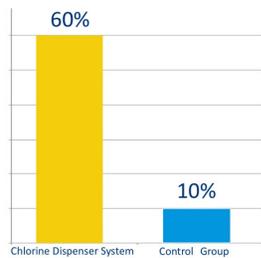
Chlorine Dispenser System: New approach to cut costs, increase convenience, salience, social learning



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Potential for Impact

High Adoption



Detectable chlorine residual at households in Dispenser Pilot.

Low Cost

- Long run estimated cost as low as
 - \$0.30 per person per year
 - 50 percent of current costs
- At scale, cost per DALY saved as low as \$20
 - Comparable to vaccines

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Potential for Scale and Sustainability

- Pilot programs :
 - Ministry of Education, Kenya
 - Ministry of Public Health and Sanitation, Kenya
 - Local Governments, Western Kenya
 - Regional water services board, Western Kenya
 - NGOs in Ethiopia, Swaziland and Bangladesh

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Ministry of Education, Kenya

- Dispensers at 33 schools
 - Water sources on premises; used by school and community
- Funded and led by MoE
 - Technical assistance from IPA
- Multi-year chlorine supply + dispenser
- Chlorine delivery through retail channel, using coupons
- School teachers lead ongoing management and community education



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Ministry of Education, Kenya

Results

- Chlorine access for > 30,000 people
- Positive chlorine tests (random) in 85 % of schools with water

Next steps:

- Integrate with school feeding, school health programs (e.g. deworming)?
 - Combined training?
 - Combined distribution of pills and chlorine?
- Leverage school program to reach student homes, communities?

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Other potential models

- Long-term government funding with ministry distribution (Ministry of Public Health and Sanitation, Kenya)
- Contracting for Services (Local Governments, Kenya)
- Bundling with water provision (water vendors, water user committees, circuit riders)
- NGO funded and managed

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Key Operational Issues

- Promoters
 - Their role?
 - Monetary payments, social recognition for motivation?
- Distributing chlorine
 - Coupon-based retail, drop-offs or public distribution?
- Managing installation, repairs, maintenance
 - Contract structure for installers?
 - Warranty models?
- Financing long-term supply of chlorine
 - Multi-year commitments (public health model)?
 - Endowments model (capitalize recurring costs)?

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Using Technology to Improve Transparency

- SMS technology
 - Supply chain management
 - Accountability
 - Financial transfers
- GPS devices
 - Monitoring chlorine delivery, dispenser re-filling



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For more information:

Email dispensers@poverty-action.org
Visit www.poverty-action.org/safewater



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The Need for Safe Water

- More than 1.6 million children die each year from diarrhea
 - Over 4000 per day
 - 20 percent of all child mortality
- Unsafe water is a leading cause
- Much of this is preventable

