

Promoting long-term arsenic-safe water consumption in Bangladesh through commitment-enhancing interventions

Naturally occurring arsenic in drinking water poses a threat to human health, especially in Bangladesh. Although sufficient safe water sources have been installed, many households continue to use contaminated shallow wells. This project aimed at improving the effectiveness of an information intervention to promote the use of existing safe water sources with systematic behavior change techniques. At 1-month follow-up, the commitment-enhancing techniques (memory aids, specific planning, and public commitment) resulted in up to 65% new users of safe water, whereas information alone achieved only 18%. The interventions' effects were mediated by increased commitment strength. Behavior change was sustainable: at 9-month follow-up, up to 46% of the intervention groups were still using a safe source.

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Context

Geogenic contamination of drinking water, such as with arsenic, is associated with chronic disease and increased mortality. Nowhere is the issue as severe as in Bangladesh, where millions of shallow wells are contaminated with arsenic. Approximately 20 million Bangladeshi are at risk of drinking water with elevated arsenic relative to the national standard of 50 micrograms per liter. Although safe water options (e.g. deep wells) are often in walking distance, and well-sharing among neighbors with safe shallow wells has been encouraged, many people still drink water from contaminated or untested shallow wells.

Objectives

The main goal of this project was to promote safe water consumption with systematic behavior change techniques (BCTs). Specific objectives were

- to assess current water consumption practices and the behavioral factors associated with these practices and
- to design, implement, and evaluate systematic BCTs to promote safe water consumption.

Activities

Step 1 & 2: Identify, measure, and determine behavioral factors of safe water consumption.

- A baseline survey about safe water consumption practices and its behavioral determinants was conducted in 710 households in November and December 2010 in several villages of Manikganj and Monoharganj, Bangladesh.
- Manikganj has lower rates of contaminated wells, so use of neighboring arsenic-safe shallow wells was the desired behavior. In Monoharganj, where there are almost no safe

shallow wells, the use of arsenic-safe deep wells was advisable.

- The behavioral factors influencing the use (vs. non-use) of arsenic-safe water options were estimated by logistic regression. The strongest associations were found for commitment strength to use safe water options and perceptions of how many others collect safe water.

Step 3: Select behavior change techniques (BCTs) and design behavior change strategies to promote safe water consumption.

- Only households which had access to arsenic safe wells but did not use them were included in the field experiments.
- Three BCTs expected to promote the key factors of safe water consumption, commitment strength and the perceived behavior of others, were selected. These were (1) *memory aids*, (2) *specific planning* (a concrete plan, when and where to collect safe water), and (3) *public commitment* (see Figure 1).
- The BCTs were combined in three interventions conjointly with information about arsenic:
 1. Information + memory aids
 2. Information + memory aids + specific planning
 3. Information + memory aids + specific planning + public commitment
- They were compared to a control group that received information alone.

Step 4: Implement and evaluate behavior change strategies:

- The interventions were delivered by trained health promoters of our partner organizations.

- The interventions' effectiveness was assessed through two cluster-randomized controlled trials (one in Manikganj, one in Monoharganj).
- 1-month and 9-month follow-up surveys were conducted on safe water consumption practices, behavioral factors and the interventions' evaluation with the same households as at baseline in April and November/December 2011.



Figure 1. Public commitment meeting in one of the villages studied

Findings

- **Up to 65% switching to arsenic-safe wells** was observed in the intervention groups compared to just 18% well-switching in the information-only group.
- The more commitment-enhancing BCTs had been applied, the higher were the behavior change effects.
- The intervention effects on behavior change were evoked through increases in commitment strength.
- The results for public commitment were ambiguous. Although the intervention that included this BCT was the most effective in promoting a switch to deep wells, it was not more successful than information alone in promoting sharing of neighboring safe wells.
- At 9-month follow-up, the intervention groups still showed up to 46% safe water users, compared to 15% in the control group with information alone.
- Arsenic tests of household drinking water corresponded well with the self-reported use of safe water options ($r=.85$).

Conclusion

Commitment-enhancing interventions can substantially increase the effectiveness of information in promoting safe water consumption.

Duration

October 2010 to December 2011

Partners

UNICEF Bangladesh
Christian Commission for Development in Bangladesh (CCDB)
Village Education Resource Center (VERC) Bangladesh

Funding

Eawag Discretionary Funds

Further information

<http://www.eawag.ch/en/department/ess/main-focus/environmental-and-health-psychology-ehpsy>

Publications

Inauen, J., & Mosler, H.-J. (2014). Developing and testing theory-based and evidence-based interventions to promote switching to arsenic-safe wells in Bangladesh. *Journal of Health Psychology, 19*(12), 1483-1498. doi:10.1177/1359105313493811

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