

## Preventing Diarrheal Disease in Developing Countries: The CDC/PSI Safe Water System Program in Zambia

CDC  
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PSI/Zambia SWS Product

An estimated 1.1 billion persons lack access to an improved water source. Hundreds of millions more drink contaminated water from improved sources because of unsafe water treatment and distribution systems and unsafe water storage and handling practices. The health consequences of inadequate water and sanitation services include an estimated 4 billion cases of diarrhea and 2.2 million deaths each year, mostly among young children in developing countries. The Safe Water System (SWS) is a water quality intervention proven to reduce diarrheal disease incidence in users by 22-84%. The SWS includes water treatment with chlorine solution at the point-of-use, storage of water in a safe container, and behavior change communication.

The CDC/PSI joint program in Zambia began in 1998 with the social marketing of 0.5% sodium hypochlorite solution branded as Clorin. Monthly sales have steadily climbed over the past seven years to 100,000-250,000 bottles sold, and families protected, per month. PSI/Zambia staff train health center staff, pharmacists, and community health workers to promote Clorin. Mobile media units and drama teams provide community education on diarrhea. Promotional materials such as posters, leaflets, and radio and TV spots increase awareness.



PSI/Zambia Promotional Poster

In an independent assessment of the program, 42% of randomly surveyed homes reported current Clorin use, and 22% said they were past users. A total of 13-33% of homes had chlorine residual in their stored drinking water at the time of the unannounced home visits. Use of Clorin was increased

when households were exposed to door-to-door or health center promotion, households were near a retail outlet for Clorin, the primary water caretaker had a secondary education, and the households were of better construction.

The Clorin project is supported by the United States Agency for International Development, and is subsidized. The average total cost per bottle in 1998, including marketing and distribution, was \$1.88. In 2003 this total cost had decreased by 82% to \$0.33. As the product is sold at \$0.09 per bottle, the financial loss per bottle decreased from \$1.72 in 1999 to \$0.24 in 2003. Net program costs are \$0.04 per person-month of diarrheal disease protection. At \$0.18 per bottle, the project would be self-sustaining at maximum capacity. However, the higher usage rate in families with households of better construction underscores the need to subsidize this product to reach those most in need at the lower end of the socio-economic spectrum.

The CDC/PSI Zambia project is a successful social marketing intervention, creating demand for a product and making it widely available through the commercial sector. In addition, access to a product means that interested NGOs can readily incorporate Clorin into their own programming. The two main challenges of this program now are achieving financial self-sufficiency while increasing demand for, and access to, the product among the highest risk populations. Zambia, with its wide Clorin use and distribution, is both an ideal location for future research on SWS programming and an example of successful country-wide, at-scale, public health programming. For more information, contact [safewater@cdc.gov](mailto:safewater@cdc.gov).

