

The Safe Water System Project: Preventing Diarrhea in Persons Living with HIV and AIDS

Background

Every year, there are approximately 2.5 billion cases of diarrhea, killing an estimated 801,000 young children. It is estimated that 88% of these diarrheal deaths are the result of unsafe water, inadequate sanitation, and poor hygiene. Diarrheal diseases also lead to decreased food intake and nutrient absorption, malnutrition, reduced resistance to infection, and impaired physical growth and cognitive development. 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 communications. Diarrheal diseases are particularly of concern for immune-compromised individuals and their families. CDC is working in partnership with organizations providing care to persons living with HIV and AIDS (PLWHA) to reduce diarrheal disease and provide families affected by HIV and AIDS clean water for health, hygiene, and infant feeding.

Uganda: Proving the SWS Reduces Diarrhea Diseases in PLWHA

In November 2002, CDC, the Global AIDS program, the Uganda Viral Research Institute, and the AIDS Support Organization (TASO) completed an 18-month study which showed that use of the SWS reduced the risk of diarrhea by 25% and the total number of days ill from diarrhea by 33% in PLWHA. The findings of this study contributed to the development of a Basic Care Package (BCP) Program in Uganda, a collaboration between the Ministry of Health, Population Services International (PSI), TASO, and CDC, to reduce the risk of opportunistic infections in HIV-infected persons. To date, the program has distributed 17,617,790 BCPs to persons living with HIV and AIDS. These BCPs include an improved water storage container, a bottle of water treatment solution, and water treatment education, among other items.

BCP Programs

In addition to Uganda, PSI collaborates with CDC's Global AIDS Program and the US Agency for International Development to distribute BCPs in other countries. Current programs include Kenya (1,063,940 BCPs distributed), Mozambique (409,850 BCPs distributed), Ethiopia (32,875 BCPs distributed), and Cote d'Ivoire (600 BCPs distributed). Distribution continues in these countries and other programs are planned.

Ethiopia: Health Impact of BCP program

CDC conducted a health impact evaluation of a BCP program in Ethiopia. Results indicated that the BCP recipient group (405 persons) were more likely than the comparison group (344 persons), at all biweekly home visits within a 4-month period, to be using an improved water storage container (65% vs. 0, $p < 0.001$) and to have detectable chlorine in stored water (40% vs. 1%, $p < 0.001$). BCP recipients were less likely than comparison group clients to report illness (44% vs. 67%, $p < 0.001$) or to have health facility visits for illness (74% vs. 95%, $p < 0.001$).

Kenya: Distributing the SWS in High Prevalence Rural Regions

CDC has worked with CARE International and PSI in Kenya to distribute and promote a water treatment solution called WaterGuard since 2000. PSI currently sells 100,000 WaterGuard bottles per month throughout Kenya. In Nyanza Province, which has the highest HIV prevalence rates in Kenya, CDC collaborates with the Safe Water and AIDS Project (SWAP), a Kenyan non-governmental organization (NGO), to empower women affected by HIV/AIDS to increase access to health products in rural communities not normally reached by the private sector. The women receive training to become community health educators and receive microcredit to purchase a basket of health products—including WaterGuard, P&G™, Aquatabs®, improved water storage containers, insecticide-treated bednets, and other items—at wholesale. They then sell the products in their rural communities at retail and the difference provides much-needed income for their families.



A midwife who promotes the product and uses it herself.

Nigeria: Using the SWS Reduces Diarrhea Incidence in PLWHA

PSI has a national-scale social marketing program of WaterGuard solution in Nigeria, which has sold 5.7 million bottles as of 2010. CDC collaborated with PSI and the NGO Hope Worldwide to distribute WaterGuard to women with HIV enrolled in a Prevention of Mother to Child Transmission program and evaluate the results. Data showed that the use of WaterGuard reduced the risk of diarrhea by 39.5%. Project partners plan to expand the marketing of WaterGuard and increase access to the product among PLWHA.

Malawi: Integration of Public Health Interventions

In Malawi, public health interventions such as handwashing, safe water treatment and storage practices, and HIV testing and counseling, have been integrated into services provided at antenatal clinics (ANC) to increase use of the interventions and to provide an incentive for women to use ANC services. An evaluation of this program revealed that, from baseline to follow-up, there was an increase in the percentage of women who had residual chlorine in water stored in their homes (0 vs. 71%, $p < 0.001$) and were able to demonstrate proper handwashing technique (21% vs. 65% $p < 0.001$). At follow-up, 89% of evaluation participants had ≥ 3 ANC visits, 90% delivered at a health facility, 99% were tested for HIV, 99% of their partners were tested for HIV, and 98% had disclosed their status to their partner. In addition, there was an increase in the percentage of pregnant women receiving antiretrovirals (ARV) (2 vs. 58%) and an increase in the use of ARV prophylaxis (0% vs. 90%) on HIV-exposed infants.



Water Hygiene Kit

Breastfeeding vs. Bottle Feeding in Infants of HIV-infected Mothers

Mothers with HIV, as well as governments and agencies providing care for families affected by HIV, face a difficult decision regarding infant feeding. Breastfeeding, which is recommended for an infant's overall health, can transmit HIV from an HIV-infected mother to her child. However, the alternative, bottle-feeding with infant formula, can increase infant morbidity and mortality due to diarrhea when formula is mixed with contaminated water. In one study conducted by CDC, results suggested that use of the SWS decreased the incidence of diarrhea in infants of HIV-infected mothers on antiretroviral prophylaxis before and after rapid weaning at 6 months of age; however, no difference was found in diarrhea incidence at the time of rapid weaning in infants whose mothers used the SWS versus those who did not. Exclusive breastfeeding for 12 months or more can protect infants from the risk of diarrhea and is desirable among infants of HIV-infected mothers on prophylactic treatment. Water given to infants should always be disinfected if the source is not known to be safe.