

conference call

Household water treatment and storage

Household water treatment works! This was the overriding message from a recent workshop at the World Water Congress in Marrakech (23 September 2004). Field experience of various household water treatment technologies, ceramic filters, chlorination, solar disinfection, bio-sand filters and flocculant/chlorine powders, was discussed. All technologies significantly reduced microbiological contamination and diarrhoea among children.

Lorna Fewtrell presented data summarizing 12 different field studies showing that diarrhoeal disease was reduced significantly by interventions improving household water quality. This contradicts the long-held view, associated with Stephen Esrey's work, that water-quality improvement is the least-effective intervention to reduce diarrhoea. Esrey's review pre-dated much of the work on non-piped water quality at point of use, and did not account for quality of water that people were actually exposed to, thus overlooking the highly beneficial effects of household treatment and safe storage.

Household water treatment technologies are a simple means of producing high-quality water, even where source water is poor. Low-cost approaches to such treatment include SODIS, which uses the power of sunlight to disinfect water by ultraviolet radiation and thermal pasteurization. Simple ceramic pot filters moulded by local artisans can be used to filter water in the home for approximately \$3/year, making them sustainable and economical. Bacteriological quality of the water is much improved and feedback from users suggests diarrhoea is reduced. These ceramic units and the bio-sand filters, low-cost slow-sand filters operated intermittently in the home, need further research to measure their effectiveness in reducing pathogens and diarrhoea. For some commercial ceramic filters, lowering manufacturing costs whilst maintaining high performance is a challenge.

Established technologies, such as adding chlorine in liquid or tablet form

to drinking water stored in a protected container, are inexpensive, and some researchers reported poor user acceptance because of taste issues. The workshop revealed that almost no research has been done on the question of user acceptability in terms of water appearance, taste and smell and other possible barriers to sustainability. Future research needs to examine the relative cost effectiveness of different technologies and their acceptability and sustainability in use.

The issue now is how to scale up from small studies of hundreds of households to the millions of households lacking safe piped water. For example, a sachet of flocculant/chlorine has been developed for adding to stored water that removes pathogens and reduces diarrhoea. To make this technology widely accessible, these sachets are now being marketed commercially in several countries, including Haiti, Guatemala and Pakistan. Research and demonstration projects are needed to identify the most effective implementation and marketing systems for household water treatment technologies to achieve widespread uptake and sustainability. Initiatives on household water treatment and safe storage also need to be accompanied by hygiene education, so that those at risk understand the dangers of unsafe drinking water, know how to use the treatment technologies effectively and practise overall household hygiene and sanitation, including appropriate excreta management and personal hygiene.

Key messages

Household water treatment does reduce diarrhoeal disease at levels comparable to sanitation and hygiene measures.

- Many different treatment technologies – including chlorination with safe storage, combined chlorination/flocculation, solar disinfection, and filtration – have all been shown to reduce microbial contamination and diarrhoea.
- More research is needed about relative cost effectiveness.
- Sustainability and user acceptance in the longer term need to be investigated.
- Local manufacture, distribution and social marketing of household water-

treatment devices, as well as socially and politically acceptable implementation systems, need more attention if the technologies are to be adopted widely.

- Household treatment and safe storage directly contribute to the achievement of the Millennium Development Goal of improving access to safe water.

Reference

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Resources

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