

## Water to save lives



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### Overview

Contaminated water is bad for health, resulting in thousands of premature deaths around the world each year. There is strong evidence that household water treatment has the biggest impact and is the most cost-effective method in reducing risks of diarrhoea. But the picture is not as clear when it comes to measuring the impact on time savings and other outcomes, nor when it comes to making investments which have a sustainable impact.

**Key words:** water and health

### Mind the development gaps

Every 15 seconds a child dies of waterborne diseases and every day 5,000 children succumb from preventable diseases caused by unsafe water and poor sanitation, such as cholera, typhoid and dysentery. Diarrhoea increases child malnutrition and premature death, and reduces school attendance.

One billion people across the world do not have access to 'improved water'. There is virtually no access to safe drinking water among the poorest 40 per cent in Africa (World Bank, 2008). Whilst, some progress has been made on the target for the water Millennium Development Goal, access to water is unequally distributed across income groups - the poorest being most likely to use contaminated water sources. Interventions to improve access to clean water are an important component of human development efforts in developing countries, and contribute to foster better health outcomes, higher incomes, and improved educational attainment.

Water interventions are of various types, improving: (i) access (quantity) to clean water supply through household and community connections; and (ii) quality of water used through treatment at source or at point-of-use, and storage facilities. Water quality interventions can be done through physical treatment such as boiling, UV exposure and filtration, or chemical treatments such as chlorination, ion exchange and treatment with acid or base. Frequently, water interventions are often combined with improved sanitation facilities to promote safe disposal of waste, and behaviour change communication to promote safe hygiene practices.

### Lessons learned

Most countries are committed to increasing access to safe water. But what is the most effective kind of intervention to reduce the prevalence of diarrhoea in developing countries?

## **Point of use water treatment interventions are most effective in improving health outcomes:**

Water quality treatment at point-of-use has been found to have a larger impact in reducing diarrhoea morbidity by 40 percent on average, and by almost 50 percent in rural areas. A new review published by 3ie shows that hand washing and sanitation have similar benefits. But water treatment at source is less effective in promoting better health (3ie Synthetic Review, 2009). Another recent review does warn, however, of the need for more rigorous evidence on the benefits of household water treatment (Schmidt and Cairncross, 2009).

Hence putting pumps in villages will have few, if any, health benefits – the water becomes re-contaminated before use. But such investments have other benefits, notably time savings from water collection.

Greater benefits still come from water supplied to households, which has both health and time saving benefits. In urban Argentina, the improved coverage of piped water and sanitation resulting from a privatisation reform led to a 8 percent overall reduction in child mortality and a 26 percent reduction in the poorest areas (Galiani et al., 2005).

However, providing piped water to households is often prohibitively expensive, both in terms of installation and maintenance costs, particularly for low-density rural populations and low-income countries. For example, the average cost of providing household water connection in developing countries is estimated to be about three-times as high as community connections such as stand-posts, boreholes and wells (WHO/UNICEF, 2000).

Despite this, the cost-effectiveness of household connections is higher because of their greater health benefits: the cost-effectiveness ratio of community connection in terms of disability-adjusted life years (DALYs) averted, estimated at USD 94/DALY by Cairncross and Valdmanis (2006), is less than half of that for a household connection.

**What is the most sustainable solution?** Treating water takes time, rather than saves time, and users often complain of the taste, so compliance rates are low and fall over time. The 3ie review shows that the impact is less if measured further into the intervention. Hence realizing the benefits of point-of-use water treatment and safe storage technologies requires sustained behavioural change among beneficiaries.

**Do water, sanitation and hygiene interventions complement or substitute each other when it comes to improving children's health?** There is controversy regarding the additionality of combined water and sanitation interventions. The evidence suggests that, in terms of reducing diarrhoeal disease risk, water treatment and

sanitation interventions are substitutes rather than complements (Fewtrell et al., 2005; IEG, 2008).

## **Closing the evaluation gap**

Overall, there are several shortcomings in impact evaluation coverage and design in water supply interventions. Primarily, there is a lack of evidence regarding the impact of water treatment interventions. There is also virtually no evidence of how these interventions effects the performance in reaching other MDG targets as few studies look beyond health outcomes. Very few evaluations address the complementarities between water and sanitation interventions.

Policy-makers need to know what works under which circumstances. Relevant impact evaluation assesses not just what works, but also why and for how much, which involve analysing the causal chain, the sustainability of the intervention, and providing a full cost benefit analysis. Little has been done to collect cost data, so cost effectiveness is rarely assessed. Such data are needed for analysis of affordability and sustainability, as well as scaling up, and replicability of interventions.

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