

Flowing away: water and health opportunities

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Despite long-standing evidence that water sanitation and hygiene are fundamental to health, health institutions have become distanced from water and sanitation since the 1970s.

In developing countries, some 2.6 billion people invest a significant proportion of their household time or money in simply securing drinking-water or somewhere private to defecate.¹ In the European Union, planners are preoccupied with the cost of serving the public's preference for bathing in sewage-free seas – as enshrined in the Bathing Water Directive, its most popular legislation.^{2,3}

Health practitioners also appreciate the importance of water. In a recent *BMJ* poll, sanitation was voted the most important medical advance of the past 150 years.⁴

Is this correct? Over 9% of the global disease burden could be prevented by better management of water (this umbrella term covers drinking-water, sanitation and hygiene).⁵ Intervention studies report reductions in diarrhoeal disease incidence averaging 25–37%, and – using the criteria of the Commission on Macroeconomics and Health – these interventions are cost effective or very cost effective in developing countries. Even these findings value only health outcomes – analysing all impacts indicates a benefit that can be valued at 3 to 34 dollars per dollar invested.⁶

Recognition of the need to better manage pollution and the environment came to a head with the environmental movement of the 1970s. This was an opportunity to reflect on and redefine health sector roles in response to a new sector. The opportunity was lost as resources were transferred to new environmental agencies that were oriented more towards ecological than human health.

At the same time, primary health care emerged as a comprehensive approach to human health, incorporating elements of primary prevention. However, advocacy for selective primary health

care soon undermined the position of water, based on claimed costs per infant death averted – claims not overturned until 1998.

Another trend saw water as a vertical intervention requiring separate treatment. The UN International Drinking-Water Supply and Sanitation Decade (IDWSSD) may have contributed to this trend by encouraging special funding streams.

Finally, water was perceived as part of a traditional health agenda being overtaken by new issues. Yet water is fundamental to both unfinished business; diarrhoea, re-emergent cholera, malaria control, Guinea worm eradication and drowning prevention – and to the new health agenda. This agenda includes noncommunicable conditions such as fluorosis, arsenicosis, hydration-related effects and exposure to modern pollutants. As safe, reliable basic services are a prerequisite for stable communities, water also affects health security, as well as emerging and re-emerging infectious diseases such as severe acute respiratory syndrome (SARS) and dengue.

A public health perspective in water management provides opportunities to both improve population health and reduce costs. In a single drinking-water contamination event in Walkerton, Canada (population 5000), seven people died and over 2300 became ill with CA\$ 64.5 million tangible costs.^{7,8} The costs in the developing world from inadequate water management have been estimated to be US\$ 34 million to households and US\$ 7 billion to health systems.⁶

Unsafe injections alone are estimated to cause 260 000 HIV infections, 21 million Hepatitis B infections and 2 million Hepatitis C infections annually through contaminated syringes.⁹ Water systems in health-care facilities transmit legionellosis and opportunistic infections to high risk groups. In a survey of 22 developing countries, 18–64% of health-care facilities were not disposing of waste properly.¹⁰

Yet the health-care setting also provides an educational and outreach opportunity. Households affected by HIV and AIDS require greater quantities of water to meet the needs of the chronically ill and excellent hygiene to prevent opportunistic infections. One study reports that the people living with HIV/AIDS who had been provided household guidance on treating water had 33% fewer days with diarrhoea.¹¹

Drinking-water provides a recent example of health-advocated policy change. The slow progress in extending of basic services leaves a billion people waiting in line for services to reach them. But empowering households to take charge of water quality can dramatically reduce diarrhoeal disease. Since the establishment of the WHO network for safe household water in 2003 there has been a tangible shift from seeing this empowerment as a dangerous competing approach to a complementary response.

Is the health system adequately prepared to exploit these opportunities? Often not. The need for surveillance of water-related disease is recognized, as in the Protocol on Water and Health,¹² but surveillance systems are often ineffective. For example, in Milwaukee, the United States of America, the surveillance system failed to detect a waterborne disease outbreak that reportedly affected almost half of the population.¹³ Similarly, health impact assessment – which considers health impacts in local decision-making – is rarely required. Tools to assess costs and impacts of policy and technical alternatives are only now in development.

Water is critically important for health. Yet it is typically low on the health agenda and the health system is often ill-equipped to engage effectively. It is time to re-engage. ■

References

Available at: <http://www.who.int/bulletin/volumes/86/1/07-049619/en/index.html>

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doi:10.2471/BLT.07.049619

References

1. Meeting the MDG drinking water and sanitation target: the urban and rural challenge of the decade. Geneva: WHO and UNICEF; 2007.
2. Georgiou S, Bateman IJ. Revision of the EU Bathing Water Directive: economic costs and benefits. *Mar Pollut Bull* 2005;50:430-8. PMID:15823305 doi:10.1016/j.marpolbul.2004.11.036
3. Address by Lord Clinton-Davis at Institution's Annual Dinner on 23 February 1994. *Water and Environment Journal*. 1994;8:335-9. doi:10.1111/j.1747-6593.1994.tb01112.x
4. Ferriman A. BMJ readers choose the "sanitary revolution" as greatest medical advance since 1840. *BMJ* 2007;334:111. doi:10.1136/bmj.39097.611806.DB
5. Preventing disease through healthy environments: linking disease burden to areas of intervention. Geneva: WHO; [in press].
6. Hutton G, Haller L. Evaluation of the costs and benefits of water and sanitation improvements at the global level. Geneva: WHO; 2004.
7. O'Connor DR. Report of the Walkerton Inquiry: the events of May 2000 and related issues, part one. Toronto: Queen's Printer; 2002. Available at: <http://www.attorneygeneral.jus.gov.on.ca/english/about/pubs/walkerton/part1/>
8. Livernois J. *The economic costs of the Walkerton Water Crisis*. The Walkerton Inquiry, Commissioned Paper 14.
9. Hutin YJF, Hauri AM, Armstrong GL. Use of injections in health care settings worldwide, 2000: literature review and regional estimates. *BMJ* 2003;327:1075. PMID:14604927 doi:10.1136/bmj.327.7423.1075
10. Safe health-care waste management, policy paper. Geneva: WHO; 2004.
11. Lule JR, Mermin J, Ekwaru JP, Malamba S, Downing R, Ransom R, et al. Effect of home-based water chlorination and safe storage on diarrhea among persons with Human Immunodeficiency Virus in Uganda. *Am J Trop Med Hyg* 2005;73:926-33. PMID:16282305
12. *Protocol on water and health to the 1992 convention on the protection and use of transboundary watercourses and international lakes*. London: Economic Commission for Europe; 1999. Available at: <http://www.unece.org/env/documents/2000/wat/mp.wat.2000.1.e.pdf>
13. Corso PS, Kramer MH, Blair KA, Addiss DG, Davis JP, Haddix AC. Cost of Illness in the 1993 Waterborne Cryptosporidium Outbreak, Milwaukee, Wisconsin. *Emerg Infect Dis* 2003;9:426-31. PMID:12702221