

Talking dirty: how to save a million lives

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Infectious diseases are still the number one threat to public health in developing countries. Diarrhoeal diseases alone are responsible for the deaths of at least 2 million children yearly—hygiene is paramount to resolving this problem. The function of hygienic behaviour is to prevent the transmission of the agents of infection. The most effective way of stopping infection is to stop faecal material getting into the child's environment by safe disposal of faeces and washing hands with soap once faecal material has contaminated them in the home. A review of the literature on handwashing puts it top in a list of possible interventions to prevent diarrhoea. Handwashing with soap has been calculated to save a million lives. However, few people do wash their hands with soap at these critical times. Obtaining a massive increase in handwashing worldwide requires a sea-change in thinking. Initial results from a new programme led by the World Bank, with many partner organisations, suggest that health is low on people's list of motives, rather, hands are washed to remove dirt, to rinse food off after eating, to make hands look and smell good, and as an act of motherly caring. Professional consumer and market research agencies are being used to work with the soap industry to design professional communications programmes to reach whole populations in Ghana and India. Tools and techniques for marketing handwashing and for measuring the actual impact on behaviour will be applied in new public–private handwashing programmes, which are to start up soon in Nepal, China, Peru and Senegal.

Keywords: Infectious disease; diarrhoea; public health; handwashing; soap; effective practice; public–private partnership; marketing.

Introduction

Diarrhoeal diseases are the forgotten killers of children. Every year about 2 million children die from these neglected diseases (WHO Report 2002), the equivalent of a full jumbo jet every 2 h. However, there are ways to prevent these deaths, and one of the best is also one of the simplest: washing hands with soap.

According to the WHO, the Acute Respiratory Tract Infections (ARIs), and the diarrhoeal diseases (DDs) together account for more than 6 million deaths each year. Public health efforts are, however, directed elsewhere. For instance, the Global Fund convened by the Group of Eight (G8) is targeted at AIDS, tuberculosis and malaria (www.globalfundatm.org). Similarly, the Global Alliance on Vaccines and Immunisation (GAVI) is targeting HIV and malaria (www.vaccinealliance.org). A further large-scale international partnership aims to 'Roll Back Malaria' (www.rbm.who.int). Why is it that only these diseases are receiving all the attention? Why are the diarrhoeal and respiratory tract infections seemingly being neglected?

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There are a number of reasons for this. Firstly, evidence about the effectiveness and cost-effectiveness of approaches to control and prevent ARIs and DDs has been confusing or lacking. Secondly, interventions to reduce diarrhoeal diseases fall under the scope of many institutions and are hence the 'darling' of none. Thirdly, initiatives, such as the water decade of the 1980s and the global push for the introduction of oral rehydration, have lost momentum. The diarrhoeal diseases lack champions, possibly because this is a difficult issue to make attractive, dealing as it does, with faeces. Though respiratory tract infections kill more children than diarrhoea does, no simple, preventive interventions have yet been proposed that can be practically implemented on a wide scale. But there are signs that the tide may be turning. This paper reviews what we know about interventions to prevent diarrhoea, and proposes that we may be at a turning point, with better evidence for new, feasible and effective interventions, such as the promotion of handwashing with soap, and renewed political will to defeat these killer infections. We further propose that handwashing may also turn out to be a key means of preventing respiratory infections.

How to prevent diarrhoeal diseases?

Diarrhoeal diseases come from excreta. At least 20 viral, bacterial and protozoan enteric pathogens, including *Salmonella* spp., *Shigella* spp., *Vibrio cholerae* and rotavirus provoke the shedding of liquids from the gut, leading to dehydration, loss of nutrients, complications and sometimes death. This shedding of liquids used to be seen as a defence mechanism by the body to get rid of microbes, but might better be thought of as a way in which the parasitic organisms manipulate their hosts to enable the parasite progeny to reach new hosts more easily (Ewald 1994). Hygiene is hard to maintain when large volumes of liquid stools are being pumped out of a sick child. One gram of faeces can contain as many as 100 million viruses and 10 million bacteria. Faeces should therefore be regarded as 'public enemy No. 1'.

If diarrhoeal disease is to be prevented, ways have to be found of stopping the pathogenic agents from getting from the faeces of one person to the mouth of another. The best means of doing this is, of course, the safe disposal of faeces. Whether a flush toilet is installed with a sewage system, a Ventilated Improved Pit latrine, or a simple hole in the ground, faecal material has to be removed from the home, which is, after all, the place where the susceptible child spends most of his or her time. And toilet facilities have to be used, especially for the disposal of infant and child stools. Handling child stools safely is, clearly, not always easy, when nappies, potties, wipes and other 'technological' aids are hard to come by. A second major route by which faecal material gets into the household environment is on hands that have not been washed after coming into contact with excreta. Studies from developing countries across the world show that on average less than 20% of mothers wash their hands with soap after cleaning up a child or after going to the toilet themselves. Even in the UK, with all modern facilities, one study showed that only 47% of mothers used soap to wash their hands after changing a dirty nappy (Curtis and Biran, in press).

If toilets are not used, or if hands are not well washed, then diarrhoeal agents can get into the environment. For example, the mother who cleans her baby's bottom often goes on to use the same unwashed hands to prepare the family's food. At this point secondary barrier behaviours become important: washing hands before preparing food, controlling flies, purifying or boiling water and the safe reheating of food, for example. However, we suggest that the primary barriers, which consist of good sanitation and handwashing with soap after faecal contact, will be of primary importance (Curtis *et al.* 2000).

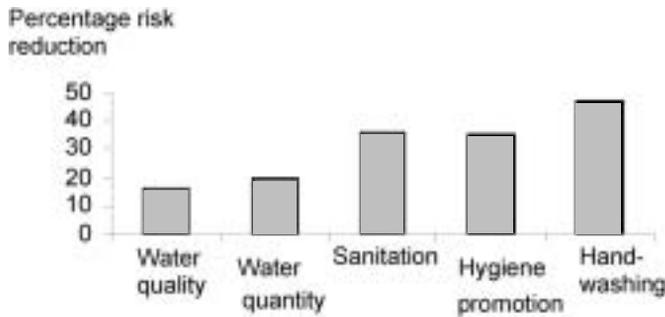


Fig. 1. The impact of interventions on the risk of diarrhoea.

Current evidence bears this out. Figure 1 shows the combined results of a number of reviews of the impact of water, sanitation and hygiene interventions on the risk of diarrhoea. Esrey's reviews suggest that improving the availability of water and its quality reduce diarrhoea risk by 20 and 16%, respectively, but that sanitation is almost twice as effective, reducing risk by 36% (Esrey 1991). Huttly's review suggests that hygiene promotion reduces diarrhoea risk by 35% (Huttly 1997). However, our recent review and meta-analysis suggests that interventions to improve handwashing reduce diarrhoea risk by as much as 47% (Curtis and Cairncross, forthcoming). If risk of death is reduced by as much as risk of disease, then handwashing might save a million lives. A further review of the small number of studies linking handwashing with respiratory tract infections suggests that handwashing reduces the risk of respiratory disease by a pooled average of 37%. All of these reviews have problems. The standard method for determining the effect of an intervention on health is the randomised controlled trial and none have yet been done for the impact of handwashing on diarrhoea (or on ARIs). Taken as a whole, the study findings are congruent with our suggestion that sanitation and handwashing are the key primary barriers to prevent diarrhoea agents getting from one person to another, and should thus have priority in the battle to prevent the diarrhoeal diseases. Handwashing may also substantially reduce rates of respiratory infection.

'Just wash your hands'

If handwashing with soap is so effective at preventing infection, it is tempting to think that a campaign of information about the benefits of handwashing might lead to a major advance in public health. However, changing long ingrained hygiene habits is not so simple. Health education has an uncertain impact on behaviour (Loevinsohn 1990). Hygiene is a complex and morally bound subject, fraught with issues of status, prejudice and dignity. Campaigns that suggest that 'dirty' mothers are to blame for the illness and death of their children, are profoundly unattractive and often only succeed in alienating their target audiences. Programmes that are not based on a clear understanding of what people want and the circumstances in which they live, are unlikely to be successful (Curtis *et al.* 1997).

Over the last 10 years our group has been researching the factors associated with domestic hygiene behaviour. Our work suggests that people everywhere want to be clean. Cleanliness is a social and private virtue, one that serves to beautify the environment, enhance personal attractiveness and social status and to demonstrate care and love for children. Hygiene also serves to remove disgusting material from people's lives: bad smells such as fish, visible stains

from contact with animal dung, and a sticky feeling after contact with 'dirt' can all be removed by handwashing (Curtis 2001). Handwashing is more frequent if handwashing facilities, such as soap and water, are easily available in locations close to contaminating events. The best time to encourage the adoption of safe handwashing seems to be at life-change events, such as at the birth of a child. Key motivations for handwashing include to *nurture* (a desire to care for children), to gain *status* and social standing and to be clean and neat in order to avoid objects and smells that elicit *disgust*. The Appendix gives some of the motives for handwashing as described by mothers in two recent formative research studies of handwashing in Ghana and Kerala, India. Our work suggests that there is an instinctive component to hygiene behaviour, operating independent of rational logic, because as mammals we have evolved behaviours that serve to avoid and remove substances that might carry a disease risk (Curtis and Biran 2001).

Public–private partnerships for handwashing with soap

'A method which is freely available and of small benefit may be more useful than one which is more effective but unavailable.' (Lines *et al.* 1989)

Handwashing may be at least as effective as some vaccines currently under development. It also has the advantage of being within reach of most families in the world today. In even the poorest countries, most people have some soap, even if it is used only for clothes and body washing. Furthermore, we know that encouraging mothers to wash their hands with soap is feasible. For example, over a 3-year hygiene promotion programme in Bobo-Dioulasso, Burkina Faso, handwashing with soap by mothers after using the toilet went from 1% to 17% and by mothers after cleaning up a child went from 13% to 31% (Curtis *et al.* 2001). The programme, in effect, paid for itself, since overall it cost less than the disease that would have resulted (Borghetti *et al.* 2002).

If handwashing is at least as protective as vaccination, then the time may have come to promote handwashing like vaccination, on a national, regional and global scale. However, to do so is currently beyond the capacity of national Ministries of Health. Major expertise in large-scale communications programmes based on the reality of local conditions is required, and so are financial resources. Natural partners for such an enterprise are the soap companies. They are masters at understanding what consumers want and at promoting behaviour change. They manage massive national and international communications programmes and they can make resources available, especially if they are convinced that there are future pay-offs from increased soap sales.

With the World Bank, the Water and Sanitation Programme, UNICEF, USAID, WHO, AED, Unilever, Procter and Gamble, Colgate-Palmolive and other local producers, we are working on developing a global public–private partnership for handwashing with soap (Fig. 2). Our first full-scale programme will be with the Government of Ghana, and aims to double handwashing with soap across the country in 2 years. Nepal, India, China, Peru and Senegal are setting up their own PPPs. The whole programme is being closely monitored and followed up to determine if this approach is feasible, effective and cost-effective and hence, replicable on a wider scale. Lessons from the work are being collected and a document giving lessons from the first year is available at www.globalhandwash.org, as are formative research instruments and results, project documents and regular progress updates.



Fig. 2. The partnership logo.

A further key to reducing diarrhoea rates across the world is the need to improve sanitation. 2.4 Billion people still need adequate means of disposing of excreta, to remove ‘public enemy No. 1’ from the domestic environment, where it puts child health at risk. The targets to halve the number of the unserved by 2015, set at Johannesburg in November 2002, will be hard to achieve. It is possible that the public–private partnership approach for handwashing may show the way forward for sanitation as well. Like the decision to use soap, the decision to install a toilet is a private one, taken not for the sake of health but for the sake of home improvement (often expressed as a desire for status and to remove disgusting smells). It also requires the provision of a product by a private provider; e.g. a mason. The marketing and business skills of industry could also be well adapted to promoting toilets for people on a very wide scale.

Large-scale programmes to improve handwashing practices and sanitation provision and use have the potential to prevent a large proportion of the two biggest child killer diseases in the world today.

Conclusion

Public health, like politics, is the art of the possible. For programmes to improve health to become widespread they have not only to be effective, feasible and cost-effective, but they also have to catch the eye of the politicians. Advocacy efforts, such as the WASH campaign by the Water Supply and Sanitation Collaborative council (www.WASH.org), have made a big difference to political will for sanitation and hygiene, as governments worldwide sign up to meet the Johannesburg targets. Efforts, such as the PPP for handwashing with soap, highlight the need to promote this simple, feasible, ‘do-it-yourself vaccine’ and demonstrate how major protective shifts in behaviour can be achieved. More work is needed: the research base is still poor, more feasible approaches to sanitation and handwashing need to be developed and above all, capacity in developing countries to research, develop and implement such programmes has

to grow exponentially. Nevertheless, new approaches and new commitment now exist to begin to meet the challenge still posed by the diarrhoeal and respiratory diseases.

References

- Borghji, J., Guinness, L., Ouedraogo, J. and Curtis, V. (2002) Is hygiene promotion cost-effective? A case study in Burkina Faso. *Trop. Med. Int. Health* **7**, 1–10.
- Curtis, V. and Cairncross, S. (2003) Effect of washing hands with soap on diarrhoea risk in the community: a systematic review. *Lancet Infectious Diseases*, forthcoming.
- Curtis, V.A. and Biran, A. in press. Hygiene in the home: relating bugs to behaviour. *Soc. Sci. Med.*
- Curtis, V., Kanki, B., Cousens, S., Diallo, I., Kpozehouen, A., Sangaré, M. and Nikiema, M. (2001) Evidence for behaviour change following a hygiene promotion programme in West Africa. *Bull. World Health Organ.* **79**, 518–26.
- Curtis, V. (2001) Hygiene: how myths monsters and mothers-in-law can promote behaviour change. *J. Infection* **43**, 75–9.
- Curtis, V.A. and Biran, A. (2001) Dirt, disgust and disease: is hygiene in our genes? *Perspect. Biol. Med.* **44**, 17–31.
- Curtis, V.A., Cairncross, S. and Yonli, R. (2000) Domestic hygiene and diarrhoea, pinpointing the problem. *Trop. Med. Int. Health* **5**, 22–32.
- Curtis, V., Kanki, B., Cousens, S., Sanou, A., Diallo, I. and Mertens, T. (1997) Dirt and diarrhoea: formative research for hygiene promotion programmes. *Health Policy Plan* **12**, 122–31.
- Esrey, S., Potash, J., Roberts, L. and Shiff, C. (1991) Effects of improved water supply and sanitation on ascariasis, diarrhoea, dracunculiasis, hookworm infection, schistosomiasis, and trachoma. *Bull. World Health Organ.* **69**, 609–21.
- Ewald, P.W. (1994) *Evolution of infectious disease*. New York: Oxford University Press.
- Huttly, S.R.A., Morris, S.S. and Pisani, V. (1997) Prevention of diarrhoea in young children in developing countries. *Bull. World Health Organ.* **75**, 163–74.
- Lines, J., Baolin, L., Renz, A. and Curtis C. (1989) Natural and synthetic repellents: the need for further assessment of the effectiveness of traditional repellents. In *Appropriate technology in vector control* (C. Curtis, ed.). London: CRC Press.
- Loevinsohn, B.P. (1990) Health education interventions in developing countries: a methodological review of published articles. *Int. J. Epidemiol.* **19**, 788–94.
- WHO (2002) *World Health Report*. Geneva: World Health Organization.

Appendix

Motivators for hand washing among mothers of young children in Kerala and Ghana

Results of qualitative analyses of data collected in in-depth interviews, behavioural trials and focus groups held in Kerala and Ghana as part of formative research for a handwashing programme.

Nurture

- ‘It is important to wash hands for the children, so the dirt and germs does not come on them’
Kerala
- ‘However busy I am I will definitely wash my hands with soap before feeding my child’
Kerala
- ‘Because I am a nursing mother I always feel good when I touch my child with clean hands’
Ghana

'I know that the child's not grown and if dirty things goes into him he will fall sick and since I don't want him to fall sick, I ensure that my hands are clean all the time' *Ghana*

Disgust

'The dirtiest thing is shit and you feel disgusted and if you have touched them you have to wash with soap.' *Kerala*

'You don't feel like touching any of these. To feel clean I have to use soap again. When you are talking of dirt you feel disgusted.' *Kerala*

'There is heat in the toilet which normally sticks on the body and makes me get a stinky smell so I make sure that I visit the toilet before bathing' *Ghana*

'After visiting the toilet due to the bad smell there you need to keep the hand very clean' *Ghana*

Status and Social Standing

'We have to mingle with others. So if we do not have bath after cutting fish others will think ill of us. This bad smell may reach their nose.' *Kerala*

'If you walk around dirty then people feel disgusted when they see us.' *Kerala*

'I wash my hands when I want to serve important people with food' *Ghana*

'We call a person who washes their hands regularly with soap a very neat person' *Ghana*