

## PART 2 MAKING IT HAPPEN

The International Decade for Action *Water for Life* was proclaimed by the United Nations General Assembly at its 78<sup>th</sup> plenary meeting on 23 December 2003. The proclamation “Calls upon the relevant United Nations bodies, specialized agencies, regional commissions and other organizations of the United Nations system to deliver a coordinated response to make ‘*Water for Life*’ a decade for action.”

In subscribing to the goals of the Decade and to those of the Millennium Declaration, national governments, external support agencies, and nongovernmental organizations commit themselves to concerted action to bring improved water and sanitation services to those who currently lack them. But how?

A coordinated response and concerted action need direction, agreement on principles and approaches that will bring cost-effective and sustainable improvements. There is plenty of advice around. On pages 34–35, we offer a wide range of further reading for those wanting a grounding in concepts relating to the drinking water and sanitation sector or details of specific actions being advocated by agencies active in the sector.

Here we look at five interventions for improving drinking water and sanitation services. These interventions are currently tackled by a wide range of institutions and stakeholders. They are all useful and valid approaches for different purposes, and as such should be seen as a series of mutually supportive courses of action. They form a series of steps towards better health that can be progressively taken in pursuit of the MDGs.

### Meeting basic sanitation demand

Without basic sanitation, ill-health dominates a life without dignity. Simply having access to and using sanitation facilities increases health, well-being and economic productivity. Inadequate sanitation has a negative impact on individuals, households, communities and countries. Despite its importance, achieving real gains in sanitation coverage has been slow. Scaling up and increasing the effectiveness of investments in sanitation need to be accelerated to meet the ambitious targets agreed at Johannesburg. What needs to be done to reach those targets?

### Significantly increasing access to safe drinking water

Water for drinking, cooking and basic hygiene represents a relatively small amount of the total quantities withdrawn for other uses. Yet, an estimated 1.1 billion people do not have access to any type of improved drinking water facility, and nearly half the world population do not have access through a

household connection or a yard tap from a piped distribution system. What can be done to improve access and to ensure that drinking water is safe?

### Focusing on changing key hygiene behaviours

Campaigns to promote handwashing with soap and safe disposal of infants' stools have been shown to deliver big health gains. They are effective ways to cut the toll of death and morbidity caused by water-related diseases. What effort is needed to ensure a lasting effect when the initial campaign is over?

### Promoting household water treatment and safe storage

There is a huge return in terms of lives saved and disease reduction from adoption of simple techniques for disinfecting water used for drinking and cooking. Household treatment cuts the primary transmission route for diarrhoeal disease and can pay back up to US\$ 60 for every US\$ 1 invested. How can we account for “safety” in coverage statistics?

### Ensuring more health for the money

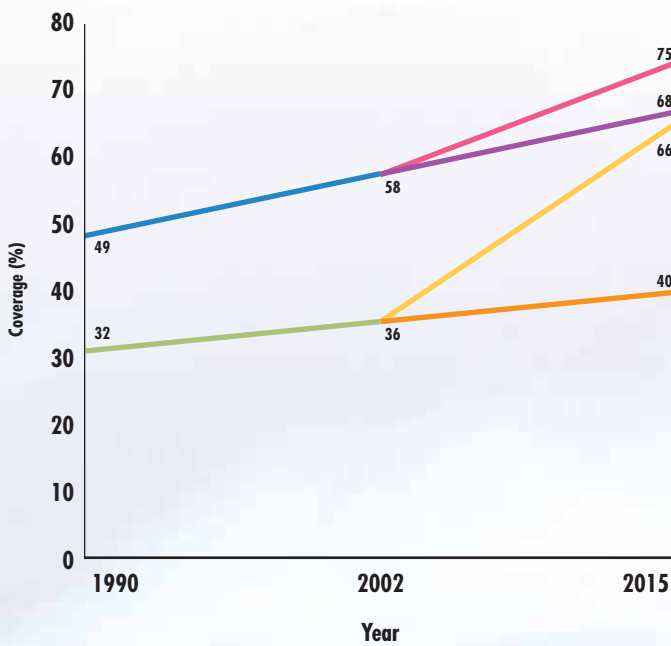
Water and sanitation interventions are cost effective and provide multiple returns to communities. Cost-effectiveness analysis is a tool for selecting the interventions that yield the most health benefits at the lowest cost. What are the cost-effective options for different situations?



## MEETING BASIC SANITATION DEMAND

In 2002 there were an estimated 2.6 billion people in the world without proper sanitation facilities, representing close to 50% of the world's population. By 2015, that number should be reduced to 1.8 billion if the MDG sanitation target is to be met. With 10 years to go until 2015, when the proportion of people in the world not served with basic sanitation is supposed to have been halved, the world is still lagging far behind the progress needed to attain the MDG sanitation target (see Figure 9). Without practical and cost-effective measures, the world will obviously fall short of its MDG aims.

**Figure 9 Change in sanitation coverage from 1990 to 2002, projection of change from 2002 to 2015 and MDG target globally and in sub-Saharan Africa**



- World coverage change 1990–2002
- Projected change in the world 2002–2015
- Coverage change required in the world to reach target in 2015
- Coverage change in sub-Saharan Africa 1990–2002
- Projected coverage change in sub-Saharan Africa 2002–2015
- Coverage change required in sub-Saharan Africa to reach target in 2015

Lack of sanitation has profound effects on the health of the world's people. As indicated in the first part of this report, children under 5 years of age in developing countries are the ones most affected by mortality and morbidity attributable to diarrhoeal diseases.

After many years of trying different approaches to sanitation in myriad contexts, we have a good idea of what the problems are and how to deal with them. It is crucial that everyone who has an interest in improving access to sanitation agrees on the interventions to be applied, and promotes and supports them. The World Health Organization, and its partner agencies, have outlined 11 key areas in which action can lead to substantive support for improvements in sanitation<sup>2</sup>.

### Making political commitments

Since the health and environmental benefits of improved sanitation and hygiene are enjoyed by the community at large and are fundamental to economic, social and health development, there should be genuine interest at all levels in expanding access to sanitation. Policy-making, planning, budgeting and implementation are key issues to be tackled.

### Legislation and regulations

Creating the right types of legislation and regulations in support of extending sanitation and hygiene services and improving their quality is essential in the process of achieving targets and maintaining achievements.

### Building capacity to make a difference

Building capacity means bringing together more resources, having stronger institutions and better trained people, and improving skills. Unless national capacity grows, nothing much will change; some regions will continue to make slow progress and others will even see coverage drop in the coming decade.

<sup>2</sup> WHO, UNDESA, UNICEF, UN-HABITAT, UNEP. *The sanitation challenge: turning commitment into reality*. Geneva, World Health Organization, 2004.

### Getting sanitation and hygiene right

Effective sanitation and hygiene programmes need to combine interventions to change behaviour with selection of the right technology. Changing behaviour requires culturally sensitive and appropriate health education. Making the right choice of technology requires an assessment of the costs (both for building the facility, and for operation and maintenance) and the effectiveness of the technology in a specific setting.

### Mobilizing financial resources

Although external support agencies and users themselves can help with funding, governments will still need to contribute most of the resources to accelerate implementation of sanitation and hygiene programmes. It is hoped that, having endorsed the MDG sanitation target, governments will allocate the required resources so that the target is achieved.

### Paying attention to gender and equity

The effective use of sanitation facilities will depend on the involvement of both women and men in selecting the location and technology of such facilities. It is also essential that facilities are designed to accommodate the special needs of children. The design of the latrine, and the location of water points and toilet facilities close to the home, can increase family members' health and preserve their dignity.

### Supporting small-scale entrepreneurs

Local entrepreneurs will continue to prove essential in reaching the millions who are yet to be served, both in rural and urban areas. On all continents, there are examples of successful local entrepreneurial efforts to provide improved sanitation services. These efforts could be replicated as a way of expanding sanitation programmes in low-income and rural communities.

#### PUBLIC TOILETS

India's largest nongovernmental organization, Sulabh International, employs 55 000 people, provides communities with clean toilets and washing facilities, and has removed the demand for night-soil porters. It also provides the former night-soil porters with training and new skills that help them find alternative employment.

A low-cost on-site sanitation system has been central to the success of the Sulabh public toilet complexes, where toilets, showers and clothes-washing facilities are provided. Toilets in slum areas cost very little, whereas those in railway stations, bus stands and markets cost more. The Sulabh toilets also provide more dignified employment for many scavengers.

### Focusing on youth and using education

Well-designed educational programmes to demonstrate the link between sanitation, hygiene, health and economic development can contribute to increasing demand for improved sanitation. Hygiene promotion campaigns are most effective among younger populations, and students can be targeted both as beneficiaries and as agents of behavioural change within their families and their communities.

### Taking responsibility for the environment

Finding technologies that safeguard the environment and maximize the potential of waste products to be reused at the local level will have a major impact on the long-term sustainability of sanitation systems and processes.

### Monitoring progress

It will be important to keep track of what is happening, monitor progress, assess the impact of new ideas on access, and evaluate whether things are really improving for households. While global estimates of coverage will remain important, local capacity to generate and use information will be a vital part of the effort.

### Making information flow

Getting the most useful information to flow from those who produce it to the people who use it is the challenge. Several types of information are relevant: technical information for practitioners and professionals; right-to-know or public participation information, deriving from the rights and responsibilities of citizens under legislation and regulations; data collected from users for monitoring purposes.

#### CONDOMINIAL SEWERS IN LATIN AMERICA

In many Latin American countries, urban households expect to connect to a networked sewerage system. In congested urban slums, this may be the only option. But sewerage is expensive. In Brazil, an alternative approach was developed more than 20 years ago and is now adopted in many cities and towns. Condominial systems are cheaper to build and easier to operate than conventional systems but have not been adopted in other developing countries as fast as could have been expected.

In Bolivia, the intervention of an external support agency (the Swedish International Development Cooperation Agency) and support from the World Bank's Water and Sanitation Program enabled the Government and the private operator in La Paz, El Alto, to experiment with the condominial approach. In such cases, external support agencies can provide access to technical or social development skills, and they can provide funds for activities that perhaps cannot initially be funded by the government's own programme because the approaches being pilot-tested fall outside existing rules and standards.

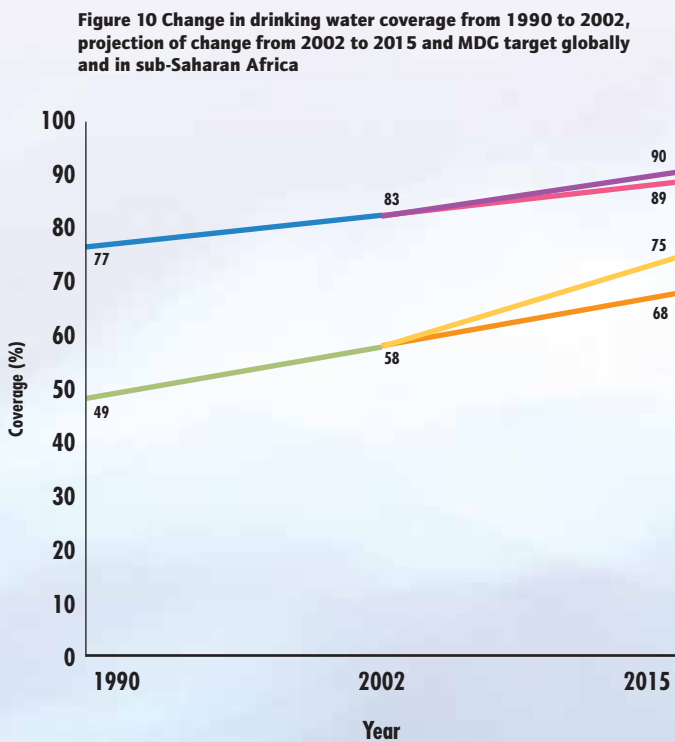
Source: Foster V. *Condominial water and sewerage systems – costs of implementation of the model*. Lima, Peru, Vice-Ministry of Basic Services, Government of Bolivia, World Bank, Water and Sanitation Program; Swedish International Development Cooperation Agency; undated.



## SIGNIFICANTLY INCREASING ACCESS TO SAFE DRINKING WATER

Human life, like all animal and plant life on the planet, is dependent upon water. Not only do we need water to grow our food, generate our power and run our industries, but we need it as a basic part of our daily lives – our bodies need to ingest water every day to continue functioning. Communities and individuals can exist without many things if they have to – they can be deprived of comfort, of shelter, even of food for a period, but they cannot be deprived of water and survive for more than a few days.

Although 83% of the population of developing countries have access to improved drinking water sources, only 42% have access through a household connection or a yard tap. Approximately 1.1 billion people do not have access to any type of improved drinking water facility. Coverage trends indicate that the world is likely to achieve the drinking water MDG target but sub-Saharan Africa is not (see Figure 10).

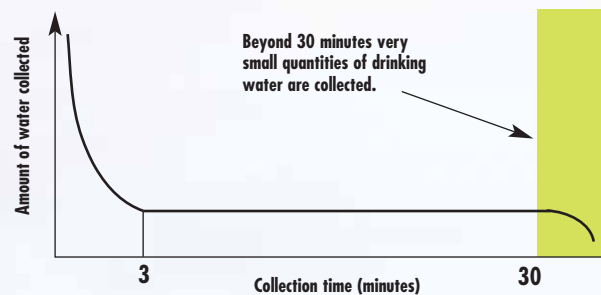


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In designing and building drinking water services, important factors should be taken into consideration such as continuity of services, quantity of water available per capita, affordability and the quality of the water provided. Unreliable services force consumers to use alternative, less safe sources and lead to problems with user satisfaction, cost recovery, vandalizing of facilities, etc.

The *quantity* of water collected and used by households has an important influence on health. There is a basic human physiological requirement for water to maintain adequate hydration, and an additional requirement for food preparation. There is a further requirement for water to support the hygiene necessary for health (see Table 2). Where it takes more than 30 minutes to go to the source, fetch water and come back, the amounts collected per capita will probably not reach a minimum requirement for drinking, cooking and personal hygiene (see Figure 11).

**Figure 11 Water consumption depends on time to source**



Source: adapted from Cairncross, 2000.

*Interruptions* to drinking-water supply either through intermittent sources or resulting from engineering inefficiencies are a major determinant of the access to and quality of drinking-water. Interpretation of data on continuity of supply requires the consideration of several components. Solving continuity problems requires extensive improvement in operation and maintenance of facilities, sound demand control, good management practices and frequently major investment in expansion and rehabilitation of production and distribution systems.

The *affordability* of water also has a significant influence on the use of water and selection of water sources. Households with the lowest levels of access to safe water supply frequently pay more for their water than do households connected to a piped water system. The high cost of water may force households to use alternative sources of water of poorer quality that represent a greater risk to

**Table 2 Service level and quantity of water collected**

Service level	Distance/time	Likely volume of water collected	Public health risk from poor hygiene	Intervention priority and actions
<b>No access</b>	More than 1 km; more than 30 min round-trip	Very low: 5 litres per capita per day	<b>Very high</b> Hygiene compromised; basic consumption may be compromised	<b>Very high</b> Provision of basic level of service; hygiene education
<b>Basic access</b>	Within 1 km; within 30 min round-trip	Average approximately 20 litres per capita per day	<b>High</b> Hygiene may be compromised; laundry may occur off-plot	<b>High</b> Hygiene education; provision of improved level of service
<b>Intermediate access</b>	Water provided on-plot through at least one tap (yard level)	Average approximately 50 litres per capita per day	<b>Low</b> Hygiene should not be compromised; laundry likely to occur on-plot	<b>Low</b> Hygiene promotion still yields health gains; encourage optimal access
<b>Optimal access</b>	Supply of water through multiple taps within the house	Average 100–200 litres per capita per day	<b>Very low</b> Hygiene should not be compromised; laundry will occur on-plot	<b>Very low</b> Hygiene promotion still yields health gains

Source: *Domestic water quantity, service level and health*. Geneva, World Health Organization, 2004.

health. It may also reduce the volume of water used by households, jeopardize hygiene practices and increase risks of disease transmission.

In many developing countries and some developed countries, water quality complying with national standards or international guidelines is not continuously assured. In many developing and developed countries, a high proportion of drinking-water systems fail to meet minimum requirements for water safety. In such circumstances, and in addition to the efforts towards providing sufficient amounts of water through improved sources to unserved populations, it is important that realistic goals for progressive improvement of water quality are agreed upon and implemented.

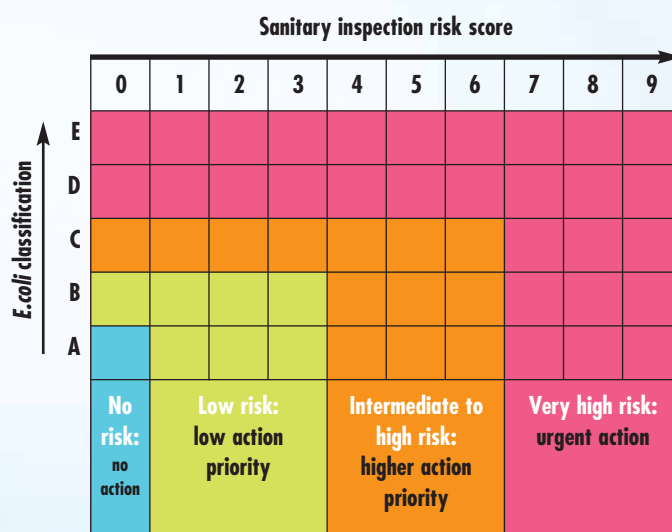
It is practical to classify water quality in terms of an overall grading for water safety linked to priority for action, as illustrated in Table 3. Grading schemes may be of particular use in community supplies where the frequency of testing is low and reliance on analytical results alone is especially inappropriate. Such schemes will typically take account of both analytical findings and results of sanitary inspection through a schema such as illustrated in Figure 12.

Combined analysis of sanitary inspection and water quality data can be used to identify the most important causes of contamination and the control measures that can prevent contamination. Such information supports effective and rational decision-making. For instance, it will be important to know whether on-site or off-site sanitation is associated with contamination of drinking water; as the remedial actions required will be different.

**Table 3 Categorization of drinking water systems based on compliance with performance and safety plans: proportion (%) of samples negative for *E. coli***

Quality of water system	Population size		
	<5000	5000–100 000	>100 000
Excellent	90	95	99
Good	80	90	95
Fair	70	85	90
Poor	60	80	85

**Figure 12 Example of assessment of priority of remedial actions for community drinking water supplies, using a grading system based on microbial quality and sanitary inspection**



Source: *Guidelines for drinking-water quality – recommendations*, 3<sup>rd</sup> ed. Vol. 1. Geneva, World Health Organization, 2004.



## PROMOTING HOUSEHOLD WATER TREATMENT AND SAFE STORAGE

Some of the 83% of the world's population who use "improved" water sources nonetheless drink water that has been contaminated – either at source or through seepage of contaminated run-off water, or in the piped distribution system, or as a result of unhygienic handling during transport, or in the home. The unserved 17% have little choice but to carry home water from unsafe sources. Simple techniques for treating water at home and storing it in safe containers could save a huge number of lives each year.

Because the treatment techniques can be cheap and the impact of improving water quality dramatic, household water treatment and safe storage can produce huge health and economic benefits (see Box on page 13 and Table 4 on page 33).

Examples of technologies include:

- ▶ chlorination
- ▶ solar disinfection
- ▶ filters
- ▶ combined flocculation/chlorination powders.

Treated water must be stored safely to prevent re-contamination, for example, using containers with narrow openings and dispensing devices such as taps or spigots.

### HOUSEHOLD WATER TREATMENT IN EMERGENCIES

Household water treatment is especially applicable to populations recovering from disaster situations. Such households often lack facilities and resources. WHO estimates that between 3 and 5 million people were unable to gain access to safe water as a result of the South Asia tsunami alone. Both central treatment of drinking water and household water disinfection have been strongly promoted in the aftermath of this natural disaster.

The adoption of home water treatment does not preclude the need for infrastructure aimed at sustainable access to safe water supplies such as piped systems, boreholes, protected dug wells, and so on. Not only water quality, but also sufficient quantities of accessible drinking water are fundamental to prevent water-related diseases.

Home water treatment can be adopted immediately in the homes of poor families in advance of centralized water treatment and distribution systems. There is a wide range of technologies, providing options to communities and households to determine what is

### EXAMPLES OF HOUSEHOLD WATER TREATMENT AND SAFE STORAGE IN PRACTICE

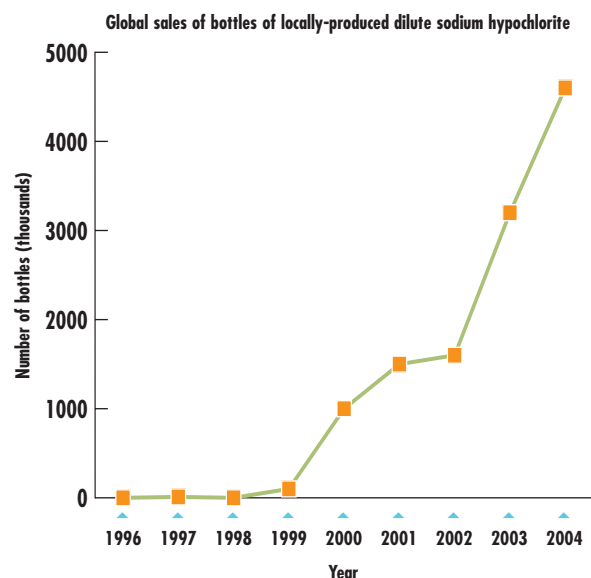
Household water management practices have been introduced in approximately 50 developing countries. These range from simple filters made from sari cloth and nylon to commercially produced sachets of flocculant-disinfectants.

When considering the type of home intervention to be applied, a key criterion is that it must be locally available and appropriate for the community. For example, a recent solar disinfection project in Kenya was successful because community members were able to get the bottles themselves. It also built on the local understanding that leaving pots, plates and utensils in the sun would help disinfect them.

Experience has shown that household treatment can be self-sustaining and promote local entrepreneurship. In Madagascar, locally produced sodium hypochlorite, sold under the brand name SUR'EAU, has been used by 18% of all households since its introduction in 2000. This is possible through social marketing, and the creation of a network of more than 10 000 community-based retailers.

The graph below shows global sales of bottles of locally-produced dilute sodium hypochlorite exclusively marketed and used for household treatment of water. Each bottle offers one to two months protection for a household of six.

Source: <http://www.cdc.gov/safewater/default.htm>



most suitable for them. Furthermore, the use of simple technologies provides scope for local industry.

Although home water treatment is an effective and useful approach applicable in many circumstances, questions about acceptability and long-term use have yet to be addressed.

#### PROMOTING HOUSEHOLD WATER TREATMENT PRODUCTS

A variety of household water treatment and safe storage products are being developed through small-scale industries worldwide. As demand for these increases it becomes possible for people to sell their products and make a living. In some areas, viable commercial micro-enterprises have been created around certain products.

For example, it has been reported that local factories in Kenya producing ceramic filters can recoup set-up costs within the first year of production.

Several local women's groups, also in Kenya, have found that there is sufficient demand for them to manufacture and sell relatively inexpensive clay pots modified for safe storage, with a narrow mouth, a lid, and a spigot.

With the backing of vigorous social marketing, local vendors in a number of African countries have been able to procure dilute sodium hypochlorite (a household water disinfection solution) at wholesale prices. These groups have been able to add other health products to their basket of goods to enhance their income-generating opportunities.

The low production costs of many household-level technologies open the door to reaching vulnerable groups through sustainable market channels.

#### MONITORING HOUSEHOLD WATER TREATMENT

In principle, the population applying correct household water treatment methods should be included among those considered to have access to safe drinking water. But comparability of country data would be compromised if that population was included from some countries and not for others. In order to obtain comprehensive information on the population applying correct water treatment methods, questions addressing this matter have recently been included in the DHS and MICS household surveys. Results from over 50 MICS and 20 DHS surveys will become available by mid-2006. The information thus obtained will allow the JMP to provide a baseline for future interventions promoting household water treatment.





## FOCUSING ON CHANGING KEY HYGIENE BEHAVIOURS

Providing improved drinking water and sanitation services, and adopting good hygiene behaviours are of the utmost importance in reducing diarrhoeal disease. Mothers should dispose of their babies' faeces in a safe way, wash their hands after defecation, after handling babies faeces, after cleaning their babies' bottoms and before preparing food in order to break the disease chain. The full benefits of improved drinking water and sanitation services will be accrued only with effective and sustainable behaviour change.

Researchers at the London School of Hygiene and Tropical Medicine claim that handwashing with soap can cut the risk of diarrhoeal diseases by 42–47%<sup>3</sup>. Good hygiene behaviour brings about huge health gains with relatively small investment.

So, handwashing is effective when it is practised, but how can the necessary behavioural change be achieved? Most handwashing campaigns are effective in the short term, but behaviour reverts to the old patterns soon after the campaign ends. An encouraging exception relates to an intensive 3-year study in an urban area of Burkina Faso, involving house visits, radio messages and training of health-centre staff<sup>4</sup>. At the end of the project, the proportion of mothers who washed their hands after using the latrine rose from 1% to 17% and the proportion that did so after handling children's stools went up from 13% to 31%. It is clear that sustainable behaviour change is difficult to achieve and requires significant resources, persistency and capacity.

<sup>3</sup> Curtis V, Cairncross S. *Infectious Diseases*. Lancet, 2003.

<sup>4</sup> Curtis V, Cairncross S. *Tropical Medicine and International Health*, 2000, 5 (1): 22-32.

### CREATING DEMAND FOR HYGIENE IN BOTSWANA

In a school in Botswana, a latrine block had recently been built by the government. Hand-washing facilities were provided, but not soap. Teachers and parents decided that this was not acceptable, and created a fund to buy soap dispensers and keep them filled. The majority of parents contributed the small sum necessary to make the improvement. The teachers introduced hand-washing into their teaching, particularly with the youngest pupils, and helped the children to arrange a cleaning rota to ensure that the latrine blocks stayed clean.

Source: WHO, UNDP, WSP. *The PHAST initiative: participatory hygiene and sanitation transformation. A new approach to working with communities*. Geneva, World Health Organization, 1997.

### SENDING THE RIGHT MESSAGES – NEPAL

In Nepal, hygiene and sanitation messages are incorporated in the school curriculum on health education. Since it was felt that regular practice is needed in order to make sanitation education more meaningful, UNICEF developed a sanitation package to facilitate the design and implementation of a sanitation programme at primary-school level. It has five major components: habit formation, and hygiene and sanitation education for students; constructing sanitary facilities at school; use and maintenance of these facilities; organizing extracurricular activities and events; and operation of a school-to-community programme. Teachers are encouraged to reinforce concepts and ideas by practical demonstrations, repetition of messages during prayer sessions and sport events, on-the-spot correction of unsanitary practices, and stimulating the use of sanitary facilities such as latrines and garbage pits.

Source: *Towards better programming: a manual on school sanitation and hygiene*. New York, NY, United Nations Children's Fund, 1998.

### EXPERIENCE IN PERU AND NICARAGUA

A study in Peru and Nicaragua by the Environmental Health Project showed notable gains in handwashing frequency and use of soap after a year's campaigning. It also recorded significant reductions in childhood diarrhoea. Key components of successful project implementation included:

- ▶ form a team – consistent participation of technical collaborators is important;
- ▶ select project communities to ensure the commitment of both communities and health workers – and develop clear criteria for selecting communities;
- ▶ work with local nongovernmental organizations and other groups active in the communities;
- ▶ pretest instructional materials;
- ▶ develop appropriate communications materials;
- ▶ ensure extensive community participation – include not only communities but individual families;
- ▶ develop and use appropriate surveys to measure change;
- ▶ design project to allow for adequate implementation time and development of local capacity.

The lesson from both countries was that hygiene promotion needs to be sustained and replicated if behavioural change is to be maintained. WHO is working with the London School of Hygiene and Tropical Medicine to develop indicators and monitoring methodologies to standardize the evaluation of handwashing compliance.

Source: Favín M. *Promoting hygiene change within C-IMCI: the Peru and Nicaragua experience*. Washington, DC., Environmental Health Project, 2004.

**HYGIENE SUSTAINABILITY**

A review of hygiene programmes in six countries to assess factors that contributed to sustainable change in hygiene behaviour concluded the following:

- ▶ Adoption of sustainable hygiene behaviours is strongly linked to the educational level of women. Better-educated women are more likely to adopt long-term hygiene behaviours. Stronger hygiene interventions are needed (i.e. more inputs, time, efforts to reach the harder-to-reach and strategies suitable for the less-educated) if more of the less-educated women are to do better in adopting hygienic practices. This highlights the value of women's education as a development priority.
- ▶ Complex behaviour changes, such as regular hand-washing and consistent use of a latrine require sustained interventions (for example, multiple home visits).
- ▶ Continued access to services is not sufficient to sustain hygienic behaviour; hygiene promotion and health education are also of fundamental importance.
- ▶ Project variables have an impact on the adoption of good hygiene practices. Key project components include: intensity and duration of the programmes; support from influential community members or groups; attendance in hygiene classes and training. Intensive interventions to promote hygiene, that use small groups and personal contact, are likely to be more effective than others in creating lasting good hygiene behaviours.

Source: Cairncross S, Shordt K. *It does last! Some findings from a multi-country study of hygiene sustainability*. *Waterlines*, 2004 22(3):4-7.

**LIFE-SAVING HYGIENE BEHAVIOUR**

Three simple actions by mothers can make a huge difference to the health of their babies and their communities:

- ▶ **safe disposal of faeces**, particularly those of babies, young children and people with diarrhoea – disposal into a latrine, or by safe burying, removes a major cause of the spread of diarrhoeal diseases;
- ▶ **handwashing** by mothers and children, after defecation (and including washing of children's bottoms), after handling babies' faeces, before preparing food, and before feeding and eating;
- ▶ **protection of water** both at its sources and when it is stored in the home – contamination of water stored in household containers is now known to be a major factor in spreading disease.

**ORAL REHYDRATION THERAPY**

Diarrhoea, aggravated by malnutrition, is a significant cause of death among children under 5 years of age. The children die of dehydration because their diarrhoea leads to a fatal loss of water and salt from their bodies. Prevention is better than cure – so improved water, improved sanitation, and hygiene education head the life-saving option. They will reduce the incidence and gravity of diarrhoea, but they will not eliminate it. Also, even if the MDG target is achieved, there will be nearly two billion people without improved sanitation in 2015. That means many millions of children at risk.

Oral rehydration therapy (ORT) is a cheap and effective way of saving lives. Widespread availability of oral rehydration salts has contributed to significant reductions in infant diarrhoeal deaths in recent years in countries as far apart as Bangladesh, Egypt and Mexico. ORT reduces the severity of diarrhoea and the duration of individual episodes. It saves millions of lives each year. What it does not do is tackle the underlying causes of the sickness. That is why it is so important to accompany ORT treatment with prevention, by tackling the primary causes of diarrhoea.

The primary causes are poor hygiene, inadequate sanitation, lack of clean drinking water, overcrowding, and poor infant feeding practices. Babies who are fed only breast milk up to the age of six months seldom get diarrhoea in that vital period. Although this report is primarily concerned with the issue of improved water, sanitation and hygiene, its co-sponsors, WHO and UNICEF, also lead the drive to promote breastfeeding and ORT as major elements of country strategies to reduce child mortality.





## ENSURING MORE HEALTH FOR THE MONEY – Costs and benefits of achieving the MDG target for drinking water and sanitation

**SUB-SAHARAN AFRICA AND SOUTH ASIA FACE A MAJOR CHALLENGE IN ACCELERATING THEIR PROGRESS TOWARDS THE SANITATION TARGET. IN OTHER REGIONS, THERE IS SCOPE TO GO BEYOND THE LIMITED TARGET OF HALVING THE PROPORTION OF PEOPLE WITHOUT IMPROVED SERVICES BY 2015.**

Proponents of higher investment in drinking water and sanitation services speak of the multiple benefits this is likely to bring. Disease prevention, fewer child deaths, social and human development, poverty alleviation, gender equity, productivity gains and environmental improvement are all cited as justification for spending more money on drinking water and sanitation improvements.

A study published by WHO in 2004<sup>5</sup> assessed the costs and benefits of meeting the MDG target on drinking water and sanitation, and compared them with four other investment options, including the ultimate achievement of piped water and sewerage for all. This analysis was based on epidemiological, demographic and economic data from global sources. Table 4 indicates that even costly interventions result in a high benefit/cost ratio.

Improved water and sanitation facilities, and better hygiene behaviour, will radically reduce illness. In addition, greater access to improved water and sanitation services may confer many other benefits. These include averted health-related costs, avoidance of time lost from daily activities as a result of illness, and time saved by having water and sanitation facilities closer to home. Time saved may translate into higher productivity, higher school attendance and more leisure time. All these benefits would have economic and social impacts, both immediate and future.

The costs of achieving these benefits would vary considerably, depending on the level of water and sanitation services chosen. The costs should take into account all resources required to put in place and maintain the interventions. These are divided into investment and recurrent costs. Initial investment costs include planning and supervision, and hardware construction. Recurrent costs are those concerning operation and maintenance of water and sanitation systems, including maintenance of hardware and replacement of parts, emptying of septic tanks and latrines, ongoing protection and monitoring of water sources, water and wastewater treatment, water distribution and wastewater collection, regulation and control of water and sanitation systems, and continuing educational activities. Each activity could be financed through a number of different sources, both public and private, internal and external, depending on the country context and which intervention is being considered.

The study found that achieving the MDG drinking water and sanitation target would produce substantial economic benefits; each US\$ 1 invested would yield an economic return of between US\$ 3 and US\$ 34, depending on the region. Globally, the cost of achieving the MDG drinking water and sanitation target is estimated at US\$ 11.3 billion a year. The benefits would include an average global reduction of diarrhoeal episodes of around 10%. The health-related costs avoided would reach US\$ 7.3 billion per year worldwide in 2015 if the MDG drinking water and sanitation target is achieved. The annual global value of adult working days gained – on the assumption that time saved is converted into income earned at the minimum wage rate in each country – would amount to almost US\$ 750 million if the target is met.

According to the study's calculations, one of the major benefits of improving access to water and sanitation derives from the time saving associated with having water and sanitation facilities closer to home. This can be achieved, for example, by relocating a well or borehole closer to the user communities, or installing piped water in houses, and reducing distances to latrines. The annual value of these time savings globally would amount to US\$ 63.5 billion in 2015 if the MDG target is met.

<sup>5</sup> Hutton G, Haller L. *Evaluation of the costs and benefits of water and sanitation improvements at the global level*. Geneva, World Health Organization, 2004

The burden of disease associated with lack of access to safe water supply and inadequate sanitation and hygiene is greatest for children under 5 years of age in developing countries. Accordingly, emphasis should be placed on interventions likely to yield an accelerated affordable and sustainable health gain among this group. The evidence points to household water treatment and safe storage, and to promoting hygiene behaviour to reduce diarrhoeal disease, alongside longer-term upgrading of water and sanitation services. Such approaches are also valid for emergency situations. A policy shift to include better household water quality management to complement the continuing expansion of coverage and upgrading of services may prove a low-cost and effective health intervention in many developing countries, particularly some African and South Asian countries likely to remain without improved drinking water and sanitation services for years to come.

## WATER AND SANITATION INTERVENTIONS ARE COST-EFFECTIVE

Table 4 shows the cost-benefit ratios for a range of interventions, for developing regions and Eurasia. Even on the most pessimistic assumptions about health impacts, income-earning potential and investment costs, the study shows positive rates of return for all the water and sanitation investment scenarios.

**Table 4 Benefit/cost ratio by intervention in developing regions and Eurasia**

	Benefit/cost ratio by intervention
Halving the proportion of people without access to improved water sources by 2015	9
Halving the proportion of people without access to improved water sources and improved sanitation by 2015	8
Universal access to improved water and improved sanitation services by 2015	10
Universal access to improved water and improved sanitation and water disinfected at the point of use by 2015	12
Universal access to a regulated piped water supply and sewage connection in house by 2015	4