

Brief No. 3

WATER SECURITY AND HEALTH

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KEY MESSAGES

The relation between water and human health has been characterised by a risk approach since the definitive studies of John Snow on cholera transmission in 1854.

Water influences health in more ways than are generally recognised, both indirectly through food production and nutrition, and occupational pollution of water sources; more directly through access to water, water quality, disease transmission through aquatic organisms, and due to vector-borne diseases such as malaria with insect vectors breeding in water. Water resource developments affect all of these.

Deliberate improvement of domestic water use and sanitation provision has made great strides in recent decades. Two targets of the Millennium Development Goals (MDGs) were to halve the proportion of the population without improved water and sanitation from 1990 to 2015.

The target will be reached for water and substantially missed for sanitation, with over 2 billion people still lacking sanitation by 2015. Over 800 million will lack 'improved' water supplies and many of those who have them will not have safe water.

Planning for the next 25 years from 2015 provides a good opportunity to look critically at the issues involved and to revise both targets and monitoring measurements, which must be congruent; both need to be simple and not create perverse incentives. This is the key year for such plans.

Some key improvements and issues need to be addressed:

- Monitoring needs to be useful to providers as well as beneficiaries and the international agencies.
- Global and national monitoring need to converge in methodology without loss of utility to governments.
- The water and sanitation targets need to become 'ladders' rather than a simple 'yes/no' categorisation.
- The disaggregation of data needs to relate to providers as well as users. This can be achieved by spatial disaggregation of data, especially in relation to population density.
- A focus on the aggregated urban poor is particularly needed and can benefit from technological change.
- The two present water and sanitation targets need to be supplemented by at least two more: one on hygiene behaviour and the other on waste water and faecal sludge.

1
RISK, HEALTH AND WATER

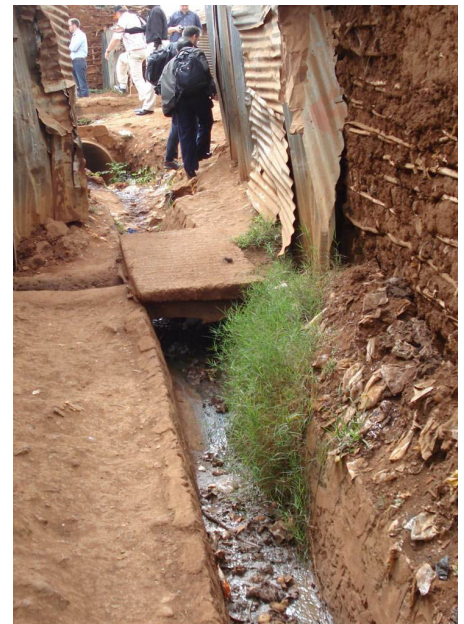
Without water we die – quite quickly. Water is intimately linked to health in very many ways, directly and indirectly, and we know much about risks in relation to health. Here we consider four aspects: the basis for the risk approach, the types of risks and how they may be viewed systematically; progress towards the Millennium Development Goals(MDGs) to reduce risks by provision of water and sanitation, and, most relevant for discussion, planning this for the 25 years following 2015.

A risk approach to water and health is not new. John Snow, a founder of epidemiology, leaped to fame by comparing the risks of getting cholera among those using the water of the Lambeth Water Company and of the Southwark and Vauxhall Water Company, showing that the risk was 14 times greater with the latter company. Earlier in 1854 he had mapped the risk of cholera in the Broad Street area of London during the most intense and lethal attack of cholera recorded in Britain and he followed it up with the experimental removal of the Broad Street pump handle. He thereby established a rigorous epidemiological approach to health risks, both the comparative risk of various water supplies and the changed risk produced by an intervention. It also inadvertently concentrated attention on microbiological water quality to the neglect of access and other relations of water to health.

2
THE RELATION OF DISEASES TO WATER AND SANITATION

Indirectly, water has huge effects on health via food production, which requires far more water than for domestic use. Diseases may be due to episodes of drought or flood, and occupational chemical pollution of water is an increasing problem of the earlier stages of industrialisation.

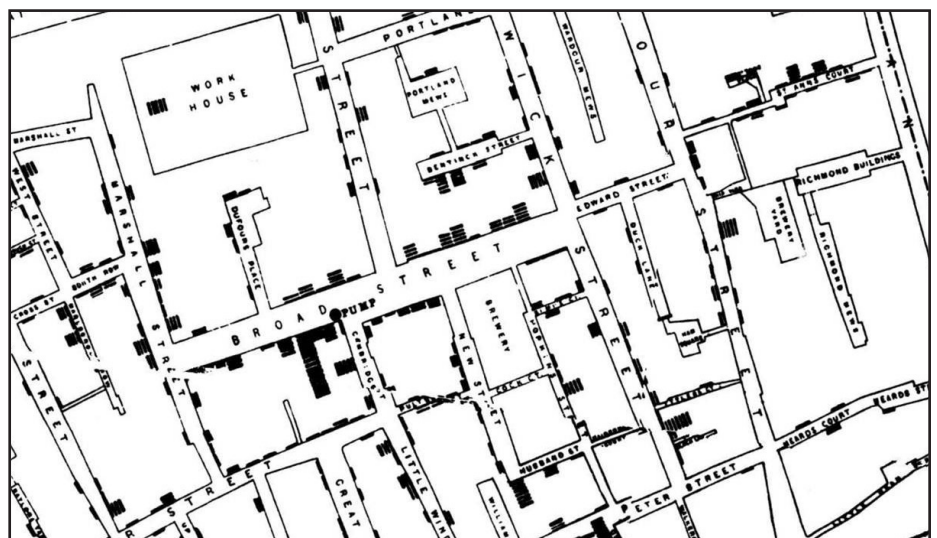
More directly, water-related health problems in poor countries are predominantly communicable diseases. Access to sufficient water matters as much as water quality, to prevent diarrhoeal diseases and also eye and skin infections. Diseases that are transmitted by aquatic organisms are strongly associated with water resources development, and surface waters provide breeding sites for insect vectors of disease,



Narrow channels carry wastewater, act as storm drains, paths and play areas in this urban slum.

especially mosquitoes. Care is needed in water developments for one purpose not to make people's health worse in other ways. As a result of large dam construction, it is estimated that an additional 18 million people are at risk of malaria and more than 40 million are liable to contract schistosomiasis. Irrigation schemes have put another 63 million at risk of schistosomiasis.

John Snow's map of Soho, London, showing the residences of those who died from cholera in September 1854.



3

THE MILLENNIUM DEVELOPMENT GOALS FOR WATER AND SANITATION

In 1990 24% of the world's population lacked access to improved water supplies and 51% lacked sanitation facilities. By 2015 it is estimated that those rates will have fallen to 8% and 33% respectively, so that the target will have been reached for water and substantially missed for sanitation. Because of population growth it has required, up to now, provision of the order of 2 billion people each with improved facilities for water and sanitation. There are likely to be about 800 million people

The nomadic pastoralists of south west Uganda receive their water from milk consumption. Their primary concern is for water for their livestock.



with unimproved water supplies and substantially above 2 billion lacking sanitation facilities by 2015. Moreover, even 'improved' water may not be safe, only less risky than before.

Targets and monitoring are integrally linked as without metrics one cannot assess progress, and targets can only be set in monitorable variables. UNICEF and WHO manage a Joint Monitoring Programme (JMP) which originally used governmental data to assess water and sanitation coverage, but these proved unreliable and since 2000 it has used data from sample surveys: these are comparable for global estimates, and are used here, but do not easily link to national needs. Currently both goals and appropriate targets for the 2015-2040 period and what is to be measured are being debated, particularly in the light of the widespread acceptance of the "human right to water", whose goal must be universal provision of water and sanitation facilities.

RURAL AND URBAN WATER SUPPLY AND SANITATION: DISTINCT PROBLEMS

Rural water supplies may need to cope with complex situations. For example, the settling nomadic pastoralists of south west Uganda, under conditions of massive environmental change and privatisation of land have often been cut off from traditional water sources; their primary concern is for water for their livestock. The traditional food source is milk so that no water may be consumed as such. Creation of farm ponds for domestic and livestock needs has increased mosquito breeding and malaria transmission. Solutions to the water and sanitation needs are likely to be locally specific.

By contrast, urban situations have a high degree of similarity across the world but with several different subdivisions within the city. Particular problems are in urban and periurban slum areas. Urban slums have very high population densities and water, sanitation, wastewater disposal need simultaneous attention, linked to housing and to solid waste disposal.

The major water problem for many rural areas is access: it may be a long walk to the borehole or river; microbiological quality is less acute than in the city where huge numbers use a single source which, if polluted with pathogenic microbes, can spread infection massively.

4 GOALS AND ISSUES FOR 2015-2040

The MDG targets were set in terms of *needs*; the classification of water-related disease transmission proved useful because it helped *providers* of water to understand the action required; it used the concepts of the providers. So also, in the next planning period it may be helpful to focus more on the providers and not only on the beneficiaries, in the way in which data are collected and related to targets. Moreover, in discussion there is a gap between governments and NGOs who think in terms of households and communities and utilities that think in terms of customers: this gap must be effectively bridged to attain sustainability.

It is clear that the binary classification of facilities as improved or not improved fails to

capture reality and some 'ladder' of progressive improvements is needed.

Though the aim is to provide safe water, there is no really cheap reliable way to assess water bacteriological quality on a large scale. This area awaits better technology before it can be meaningfully assessed on a population scale.

Needs of different patterns of living vary, and the best guide to this is probably residential population density, so monitoring data needs to be disaggregated by settlement type – progress in classifying from satellite images is rapid. Within the city two areas are of special concern: the urban slums and peri-urban poor settlements. The 'aggregated poor' who live in these areas are a high priority component of the underserved. It is likely that different water and sanitation solutions will be needed for the the slums and for the unserved poor who live dispersed in the city. The latter need to be covered by the utilities already supplying their neighbours.

The urban slums tend to have very

high population densities, little space between dwellings and difficulties of access for vehicles (to collect garbage for example) or to lay pipes so that integrated upgrading of these slums is required; in the short run community-based sanitation can achieve much.

Peri-urban slums may be more spacious as they are on formerly rural land that is being settled; but they often have two additional problems: a more transient population with temporary accommodation and they often lie just outside the urban area jurisdiction in areas illegally squatted. Sometimes no local government authority will take responsibility for them. Using satellite imagery may simplify delimiting them. A further challenge in least developed countries is to provide facilities for the smaller towns springing up throughout Africa, in particular.

Not only is sanitation lagging far behind water supply, its provision has, understandably but not sustainably, focused on the provision of toilets to the neglect of the downstream fate of the sewage and wastewater. It will be essential in the future to ensure proper disposal of wastewater, and this would of necessity in cities also involve proper disposal of garbage and solid wastes that obstruct the culverts as well as collection and treatment of contents of pit latrines and septic tanks. A human rights approach requires attention to making congruent the right's reciprocal responsibilities. Hygiene behaviour thus needs attention; and if progress is to be made overall it will depend on ensuring that every household's water and sanitation needs are the effective responsibility of an appropriate provider institution.

Peri-urban area of an African city: it shares rural and urban features and the diseases associated with each situation.

