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# Where clean water is a pipedream

By Richard Black  
Environment correspondent, BBC News website



BLACKSMITH, INSTITUTE

For nearly one billion people, clean drinking water is still a mirage

## If you want a graphic demonstration of the health impacts of poor drinking water, look no further than Zimbabwe.

Three thousand people dead, at least 60,000 ill - all from a disease that is almost completely preventable.

In general, with very few exceptions, people simply do not get cholera when the water supply works. It is almost unknown in the west for that single, simple reason.

As the World Health Organization (WHO) puts it: "Measures for the prevention of cholera have not changed much in recent decades, and mostly consist of providing clean water and proper sanitation."

In Zimbabwe, political and economic circumstances have created a situation where the availability of clean water and proper sanitation is no longer routine.

People are now feeling the impacts of that lack of investment - investment that research shows is well worthwhile.

"Research shows that if you invest \$1 in clean water and sanitation, the return is between \$5 and \$28," says Yves Chartier of WHO's water, sanitation, hygiene and health unit.

The cholera bacterium is far from being the only infectious microbe lurking in dirty water. Typhoid, cryptosporidium, giardia... the list continues.

"About 10% of the total global burden of disease is down to poor

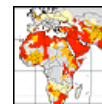


“ The provision of safe water and sanitation... remains the critical factor in reducing the impact of cholera outbreaks ”

WHO

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water, sanitation and hygiene," says Dr Chartier.

It was this kind of statistic that led governments to sign up in the year 2000 to the Millennium Development Goals (MDGs) - a set of targets on issues such as maternal health, education and poverty.

The water target is straightforward - to halve the proportion of the world's population without access to clean water and proper sanitation by 2015.

In the years immediately following the signing of the MDGs, water and sanitation were seen as "poor cousins", attracting less aid money and interest than some of the other issues.

But on water, at least, that has changed.

"The world as a whole is now on target to meet the water MDG, but a number of countries and regions are still off track," says Andrew Hudson of the UN Development Programme's (UNDP) water governance programme.

"Most of the countries that have made impressive progress were poor countries, and that to me is a tremendous message because it shows it's less about the money and much more about the political will."

### Protect and survive

Statistics are compiled on the basis of "reasonable" access to "improved" supplies of drinking water. This means that within a kilometre or so there should be a source such as a standpipe, a borehole, a protected well or spring - or, of course, it can come straight into your house.

The "protection" element is aimed at making sure that unwanted things including the cholera bacterium do not get into the water source - especially preventing people and animals from defecating in the vicinity.

That is sometimes easier said than done, especially in city slums, where the sheer lack of space often means latrines have to sit next to supply streams - or even, in extreme cases, that the outflow from the latrines becomes the supply stream.

UNDP data shows that in many countries, as the urban population increases, the proportion of that urban population with access to safe water declines; infrastructure investment does not keep up with a growing urban population.

And whereas investment in water has put the world on target for the water element of MDG 7, sanitation is a different matter.

"There's still a stigma of talking about sanitation," comments Dr Hudson.

"But countries such as India, that have mounted massive community-led campaigns on things like elimination of open defecation, have made really big strides."

### Underground movement

In eastern India, however, and in neighbouring Bangladesh, another way that poor water causes poor health has come into dramatic relief in recent years.

In the 1980s, tales of illness in Bangladeshi villages began circulating

Blacksmith Institute

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#### THE WATER TARGET

“ Halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation ”

Millennium Development Goal 7.C

“ There's still a stigma of talking about sanitation ”

Andrew Hudson, UNDP

Millennium goals: Down the pan?

- an illness that was eventually traced to arsenic in the water they were drinking.

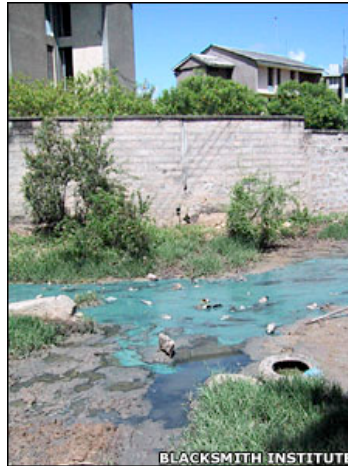
With surface water sources likely to harbour disease-causing microbes, aid agencies had initiated a programme of digging wells to provide safer drinking water - not realising that the water would bring with it enough arsenic to constitute a chronic poison.

The problem has now been detected in other countries, and according to one recent estimate, about 140 million people are at risk from drinking water containing the toxic metal, which causes cancers and lung disease.

Compared with water-borne microbes, water-borne pollution has received little attention, according to the Blacksmith Institute, a charity whose aim is to clean up pollution hotspots in developing countries.

Cleaning up the India/Bangladesh arsenic problem is probably beyond anyone's capacity right now - although agencies are looking at it - but industrial pollution is a different matter.

In the slums of many developing world cities, you find water of hues that water does not naturally assume - blues, yellows, purples and greens that speak of industrial outflows not very far upstream.



Industries such as tanning can leave their trace in water

"So we've been running pilot projects in India trying to clean up hexavalent chromium, which is produced by the country's huge tanning industry," says Blacksmith's executive director Meredith Block.

(Hexavalent chromium, the pollutant involved in the Erin Brockovich case in the US that was immortalised on celluloid by Julia Roberts, is a known carcinogen.)

"And by injecting a chemical (an "electron donor" into the groundwater we could turn it to the [non-toxic] trivalent form; analysis suggests it's working, with no side-effects."

One of these pilot projects, in Kanpur, was on a site that Ms Block says is typical of many developing world cities - an industrial estate, home to perhaps 50 or more small factories, working with or producing a mix of hazardous substances such as heavy metals and pesticides.

The health impact of water pollution globally is unknown.

A 2007 study from Cornell University estimated that 40% of deaths worldwide were associated with some kind of pollution - though how much of this is water-borne is another question.

But, says Ms Block, it is proving hard to interest agencies in polluted water.

"The environmental causes aren't related to climate change or global warming," she says. "And it seems that people in the US couldn't care less if you can't relate an issue to global warming."

Diseases such as cholera, by contrast, do have a climate link. The cholera bacterium (*Vibrio cholerae*) appears to survive better in warmer waters, leading to fears that it could emerge in regions such

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as the southern coasts of the US as sea temperatures increase.

But for the mass of humanity, climate is likely to be a minor determinant of the water quality they get, and the disease burden that implies.

To quote the WHO on cholera: "Since 2005, the re-emergence of cholera has been noted in parallel with the ever-increasing size of vulnerable populations living in unsanitary conditions.


"The provision of safe water and sanitation... remains the critical factor in reducing the impact of cholera outbreaks" - as it does for many other diseases of water.


It sounds easy - but for the 100 or so countries off target with MDG 7, most spectacularly Zimbabwe, it is proving anything but.

*Richard.Black-INTERNET@bbc.co.uk*

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