SANDEE
South Asian Network for Development and Enviornmental Economics

POLICY Brief

Number 8-05, August 2005

Danger Dirty Water! An Assessment of the Importance of Information in Improving Water Use Hygiene

The improvement of drinking water quality is a key challenge across the developing world where millions die or fall ill due to unsafe water and inadequate sanitation and hygiene. The sad fact is that many of these deaths and illnesses could be avoided by improved infrastructure, increased public information, and better management of water services. But what is the best way to get people to drink safer water?

A recent SANDEE study examines this issue by asking whether better information can lead to safer drinking water practices. Will households who are informed about the quality of their drinking water take action to improve it? To answer this question, SANDEE researchers surveyed a randomly selected group of households from a Delhi suburb, and, tested the quality of water in their houses. They found that 61% of unpurified water tested 'dirty,' indicating the presence of fecal bacteria. Interestingly, alerting people to the fact that their water supply is contaminated is quite beneficial. Households that were initially not purifying their water, and were told that their drinking water was contaminated, were 11 percentage points more likely to begin some form of home purification than households that received no information.

This strong effect of information on household water hygiene behavior suggests that there is a serious under-provision of information in developing countries regarding water quality. The public sector and NGOs have an important role to play in providing information that could potentially lead to a decline in sickness from waterborne diseases.

Knowledge about water quality and the health impacts of contaminated water is very low in many developing countries including India. This often means that people do not take the necessary health precautions required to guard themselves against bacteria in dirty water. The public health implications of this type of inaction are appalling: in India there are more than a million child deaths per year as a result of waterborne diseases such as diarrhea.

A RANDOM EXPERIMENT

In this study, Somanathan and Jalan undertook a survey to understand how households purify water. The survey kicked-off with a pilot study of the water quality in some randomly chosen households. More than 90 percent of water samples from the pilot survey were found to be contaminated. Following the pilot survey, 2001 census data was used to choose a random sample of 1,000 households, which were ordered by wealth. A more wide-ranging survey was carried out amongst these households and information was gathered on

This policy brief is based on SANDEE working paper No. 8-04, 'The Importance of Being Informed: Experimental Evidence on the Demand for Environmental Quality' by Jyotsna Jalan and E. Somanathan. The full report is available at www.sandeeonline.org

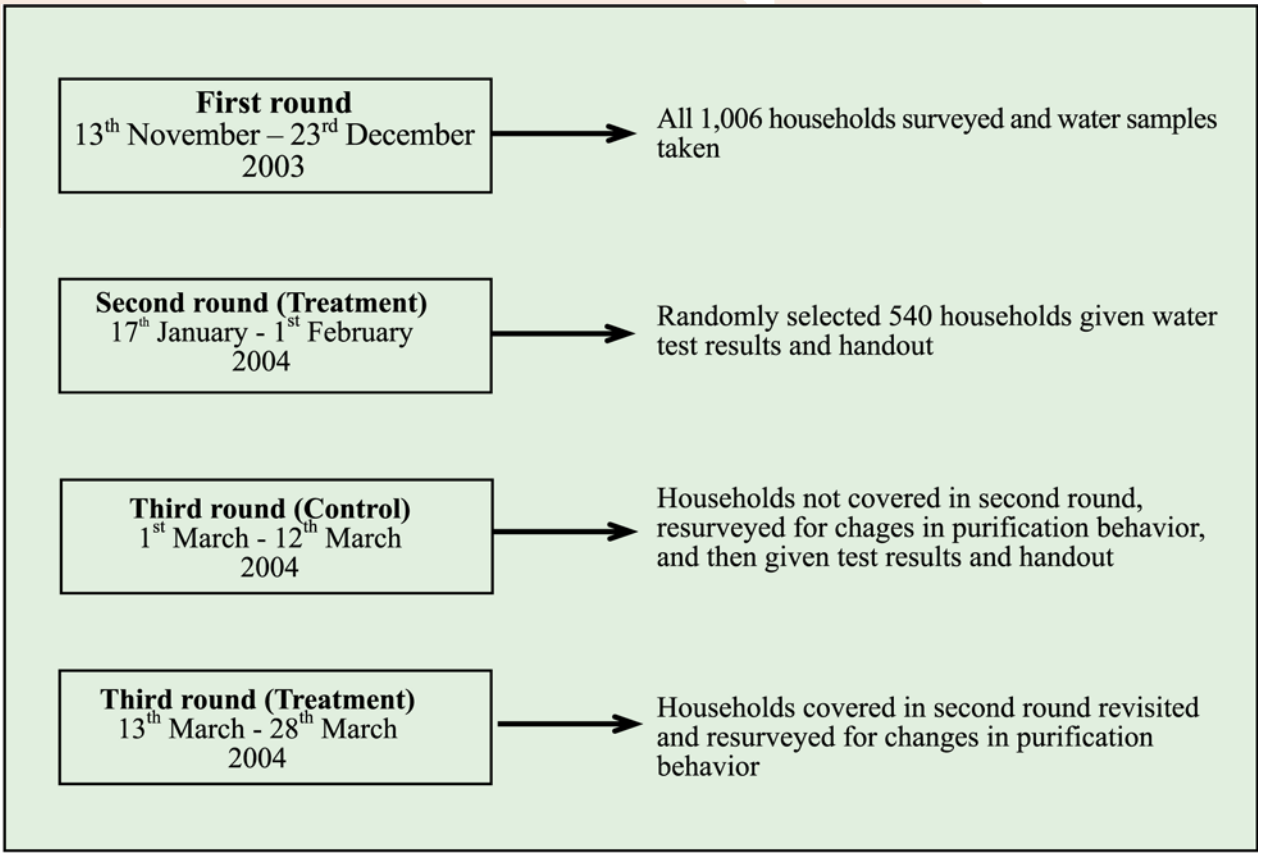
household demographics, on the source and quality of the households' drinking water, on whether they used any purification methods, and on their general awareness levels regarding health and sanitation issues. At the end of each interview, a sample of unpurified drinking water was taken from each household's water supply. If the household purified its water in any way, a sample of this treated water was also taken.

Throughout the survey, the research team used water-testing kits that test for bacteria of fecal origin. While most fecal bacteria are not themselves pathogenic, their occurrence shows that pathogens may be present. The survey test kits were purchased from TARA, a non-profit development organization based in Delhi. The kits cost Rs 20 (less than 50 US cents) per sample, are available off the shelf, and are simple enough for households to use themselves.

The second main phase of the survey involved revisiting 520 households from the original 1,000 household survey. Households were given their test results and these were explained. Handouts were also distributed which suggested that householders could, if they wished, adopt one of a number of cost-effective water purification methods. Information on safe water storage and handling practices was also included.

In the third and final round of the survey, all sampled households were revisited (after a break of about seven weeks) and surveyed to see whether they had changed their water purification behavior in any way.

FIGURE 1: TIME-LINE OF SURVEY PROCESS



A MURKY PICTURE

From the initial survey, it was found that 41 percent of households already used some form of water purification and that the average annual household expenditure on purification was Rs 253. It was also found that private purification methods were not very effective in reducing contamination rates - 55 percent of home-purified drinking water tested "dirty". This was put down partly to the need to store purified water, under which circumstances it could become easily contaminated.

The most striking finding of the survey was that information about water quality did prompt action. After the findings had been analyzed and the effects of factors such as wealth screened out, it was possible to highlight the impact of the water quality survey on the various households. Households that had been told that their water was "dirty" - and which were initially not doing any home water purification - were found to be 11 percent more likely to have begun purifying their water (seven weeks later when the researchers returned) than households that had not been informed of their test result.

By way of comparison, the National Family Health Survey for urban Indian households shows that the probability of home water purification rises by five to 12 percentage points when households from one wealth quartile are compared to houses from the next quartile up. The same data shows that this probability rises by around one percentage points with a year's increase in schooling of the most educated member of the household. These findings were backed up by the Gurgaon survey, which found that an additional year of schooling for the most educated

WHAT DO WE KNOW ABOUT OUR 'DIRTY' WATER?

The lack of knowledge about 'dirty' water was very clear from this survey - 45 percent of those surveyed in this study did not include 'drinking contaminated water' among the possible causes of diarrhea. Yet, actual contamination rates of unpurified water were quite high - 61 percent of unpurified water tested "dirty" i.e., positive for the presence of fecal bacteria. By way of comparison, in the United States, if even a single sample of tap water tests positive for fecal coliforms, then the local water authority is in violation of federal regulations issued under the Safe Drinking Water Act. These regulations also stipulate that local authorities inform individual households about any violation of the standards in their jurisdiction. In India, on the other hand, tap water is unregulated and the results of any water quality tests conducted by government authorities are generally not made public.

member of the household was associated with a four percentage point rise in the probability of purification, while a move from one wealth quartile to the next was associated with a 15 percentage point rise. Thus, if we want to increase household demand for safe water then providing direct information about the quality of water is as important as decreasing poverty or improving education.

POLICY IMPLICATIONS

From this research it is apparent that even one-time targeted information on water quality can have a considerable impact on health awareness and will also prompt practical disease prevention action. Whether such awareness will ultimately lead to a significant decline in the incidence of waterborne disease is a question for further research, however, it is probable that this will be the case.

For policy makers and those involved in public health promotion, it is clear that regular water testing linked to public information campaigns about water safety can help improve the way in which people treat their water, and that such campaigns can improve peoples chances of avoiding waterborne illnesses. *It is also likely that such measures will increase both demand, and political pressure, for improvements in water supply quality in addition to raising the amount that people are willing to pay for such improvements.*

More generally, this research shows that if the issue of information provision is not taken into account when measuring the demand for environmental quality, then there is likely to be a significant underestimate of that demand. This means that information provision must be considered in any policy analysis relating to environmental quality and that it must also be considered as a central plank in any policy relating to environmental and welfare improvements.

SANDEE

The South Asian Network for Development and Environmental Economics (SANDEE) is a regional network that seeks to bring together analysts from the different countries in South Asia to address their development-environment problems. Its mission is to strengthen the capacity of individuals and institutions in South Asia to undertake research on the inter-linkages among economic development, poverty, and environmental change, and, to disseminate practical information that can be applied to development policies. SANDEE's activities cover Bangladesh, Bhutan, Nepal, India, Pakistan and Sri Lanka.

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This policy brief is an output of a research project funded by SANDEE. The view's expressed here are not necessarily those of SANDEE's sponsors.

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