

## Basic Hygiene Can Beat Diarrhoea - A Lesson From the Slums of Dhaka

Diarrhoea is a common water-borne disease amongst slum children in Bangladesh and is one of the five leading causes of infant illness and death in the country. Now, a new SANDEE study has looked at the causes and impacts of this disease in the slums of Dhaka. The study finds that overcrowding and poor basic amenities, coupled with a lack of attention to basic personal hygiene, results in a high risk of infection. Fifty percent of children in the study sample suffered from diarrhoea during a two-week period prior to the survey. However, relatively simple measures, such as the use of a narrow-neck water container or hand-washing can reduce diarrhoeal risk and duration. The mother's education and awareness also play an important role in lowering the prevalence of diarrhoea. The study assesses the financial cost of diarrhoea to households and finds that slum households spend approximately 1% of their annual income on diarrhoea related costs.

The study is the work of M. Jahangir Alam from the Department of Economics and Social Sciences at BRAC University in Bangladesh. He recommends that the best way to combat the diarrhoea problem in Dhaka's slums is for NGO and media public information campaigns to give more emphasis to safe storage of water, effective hand washing and other basic hygiene issues. Another obvious but important recommendation is that the state should provide clean water 24 hours a day to slum communities.

### DIARRHOEA IN THE SLUMS OF DHAKA

There are a total of 1,925 slums and 267,065 households who live in these slums within the Dhaka Metropolitan Area. Dhaka's slums are the place in Bangladesh with the highest prevalence of diarrhoea. In these slums, 27 percent of all deaths are attributable to the disease. Diarrhoea is usually caused by the ingestion of water or foods contaminated with faecal coliforms or other pathogens or faecal-oral contamination. According to the World Health Organisation, unsafe water supply, inadequate sanitation facilities and a lack of awareness of personal hygiene issues cause 88 percent of all diarrhoea attacks.

Jahangir selected households from four slum zones to take part in a household survey. Data was collected on a total of 480 households from 32 slums. Women were chosen as the principal respondents to the survey because they are more aware of their children's health conditions. Information was collected on household members, household status, the frequency and length of diarrhoea attacks, the financial cost of diarrhoea, the water systems the households use, water collection and storage, behavioural factors related to water use, sanitation facility and sanitation use, and awareness and hygiene.

### SLUMS, WATER AND SANITATION SERVICES AND THE PREVALENCE OF DIARRHOEA

The data shows that taps are the primary water source for about half of all slum households. Another 46 percent of slum households have no specified water source and gather water from wherever it is available. In terms of sewerage, only 12 percent of slum households possess water-sealed latrines; 21



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and 23 percent possess open and pit latrines respectively, while the remaining 44 percent have no specified system of sanitation.

Of the 613 children in the sample, nearly 50% had suffered from diarrhoeal attacks within the 15-day period prior to the survey. The average duration of child diarrhoea attacks was between three and four days. Nine percent of children surveyed had suffered from diarrhoea for over seven days. About 40 percent of the households who had children affected by diarrhoea had water available for 24 hours a day; 45 percent of the unaffected households had the same facility. Interestingly, only eight percent of diarrhoea-affected households thought that diarrhoea is caused by drinking contaminated water; in comparison, about ten percent of the unaffected households made the connection between contaminated water and diarrhoea. In general, there was very little understanding of the connection between diarrhoea and dirty water.

## WHAT REDUCES DIARRHOEA?

Several factors contribute to a reduction in diarrhoea prevalence and duration. For example, the use of a narrow-necked container to store water reduced the incidence of child diarrhoea by about 11 percent. This is most likely because dirt and flies cannot easily contaminate water stored in this way. Practices such as straining water before use don't seem to help – possibly because the proper procedure is not followed.

The role of the mother is critical to diarrhoea reduction. The probability of diarrhoeal attacks fell by 21 percent if a child's mother participated in hygiene related awareness activities organised by an NGO. The probability also fell (by 13 percent) if a child's mother had received more than a primary level education. This may be because education helps mothers to develop basic ideas about health and hygiene.

Good hygiene is very important for stemming diarrhoea. The probability of a child contracting diarrhoea fell by 12 percent if the child's mother washed at least one of her hands with soap after she had defecated. The duration of a diarrhoea attack was found to shorten (by 26 percent) when household members practiced this basic hygiene precaution. Information and advice are also key factors: owning a radio or television contributed to a reduction in the probability of a child suffering from diarrhoea. This implies that people pay attention to the hygiene and health-related awareness messages on radio and television. The diarrhoea attacks of children whose mothers participated in NGO hygiene awareness activities was 31 percent shorter than the attacks suffered by children whose mothers did not participate in such activities. Overall, it is clear that behavioural factors (such as good hygiene) contribute more than engineering measures to both reducing the risk of children getting diarrhoea and to reducing the duration of their attacks.

Figure: Duration of Child Diarrhoea within the Recall Period of 15 days

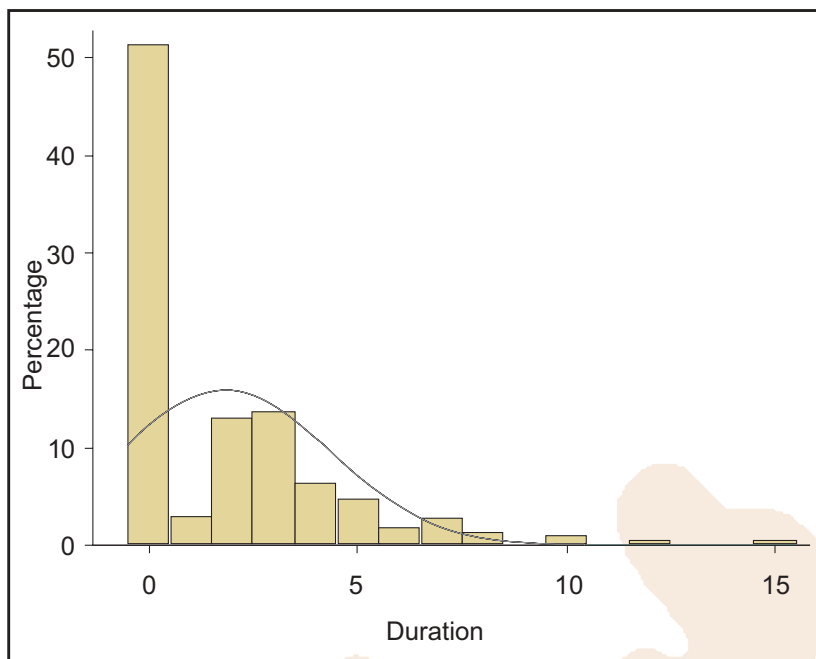


Figure 1(a) With and without Diarrhoea

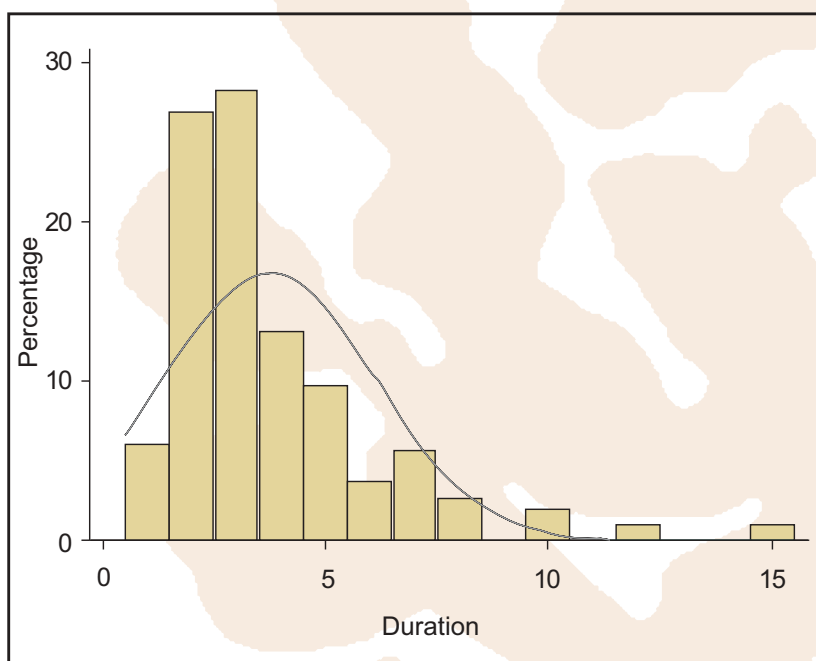


Figure 1(b) With Diarrhoea

## COUNTING THE COST OF DIARRHOEA

In order to understand the full implications of diarrhoea on children and their families Jahangir estimated the economic costs borne by those households in which children were affected by the disease. He found that households incurred a number of different direct costs when a child suffered from a diarrhoea attack. These were: home treatment costs, including the cost of shop-bought medicine and home-made oral rehydration saline; medical treatment costs, including hospital admission fees, boarding charges, doctors' fees and the cost of diagnosis and medication, and; transport costs, including costs for travelling to and from medical centres.

## The Economic Cost of Diarrhoea

There are several studies, other than Jahangir's, that have estimated the cost of diarrhoea in the developing world. For instance, Patel et al. estimated that the average cost (direct medical, non-medical and indirect costs) of treating diarrhoea per child in urban India is about USD 14 per episode. In the Philippines, the average cost per episode has been estimated at between USD 9 and USD 7 for urban and rural areas, respectively. Overall, the cost per child per episode of diarrhoea ranges from USD 1.94 to USD 14 in Asia. The cost of treatment of diarrhoea in developing countries varies considerably because of the diversity of health care systems, the differences in hospital capacities and the scope and sources of funding. Moreover, there are differences in the way in which countries price drugs and in per capita incomes.

To estimate the monetary value of diarrhoeal attacks, researchers normally use economic models that take into account the behavioural responses of households. Using such models, it can be shown that an individual's willingness to pay (WTP) for a small reduction in the exposure of children to diarrhoea is comprised of four main elements. These are: Lost earnings due to diarrhoea, the cost of activities that prevent (or avert) the disease, medical expenditures, and the monetary value of the disruption (or disutility) caused by the illness. For children, sick days during diarrhoeal illness have no real implication in terms of loss of income. However, for parents and other family members a sick child can require them to stop work and so lose income. An ill child can also mean that an adult will have to give up their leisure time. Both of these time-related issues should be included in any comprehensive cost estimation.

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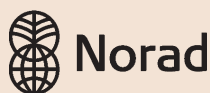
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Table: Different Types of Cost of Child Diarrhoea (BDT) per episode

Variable	Mean
1. Home treatment cost (saline, doctor fee and medicine from local store)	92
2. Medical treatment cost (admission, sit, doctor fee, medicine)	140
3. Transport cost	56
<b>Direct Cost (1+2+3)</b>	<b>100</b>
4. Work lost due to child diarrhoea (valued at wage rate)	148
5. Leisure lost due to child diarrhoea (valued at wage equivalent)	152
Indirect Cost (4+5)	188
<b>Total Cost of Child Diarrhoea (Direct and Indirect Cost)</b>	<b>276</b>

To calculate the total cost of a diarrhoea attack Jahangir added these direct costs to the value of the time given by the person looking after the child suffering the attack. Lost leisure and work time were both valued and, depending on the way in which this was done, the total cost of each episode of child diarrhoea was found to range from BDT 124 (USD 2) to 276 (USD 4). This means that the cost of diarrhoea attacks per child per year is between BDT 296 to 656 and that the yearly cost of diarrhoea to an average household ranges from BDT 378 (USD 5.5) or about 0.6 percent of household income to BDT 837 (USD 12) or 1.31 percent of household income (For more on this issue, see the side bar).

## HELPING THE MOTHERS FIGHT DIARRHOEA

Jahangir's analysis suggests that policy measures should focus on promoting hygiene related awareness activities. These should focus on issues such as the use of narrow-necked containers and hand washing with soap after defecation. Jahangir's study also shows that the mother is very important in stemming the incidence and severity of childhood diarrhoea. Although this is a finding that emerges from many studies on this subject, it is worth reiterating and shows that mothers should be a key focus of any public health campaign designed to address the diarrhoea challenge.

It is also noteworthy that a very low percentage of people in Jahangir's survey understood that drinking contaminated water causes diarrhoea. There is clearly an urgent need to increase awareness about the link between water contamination and diarrhoea. This means that health and hygiene awareness campaigns by the NGOs and the media should work to get this message across swiftly to communities that are at risk. Alongside the need for more health awareness campaigning, Jahangir also highlights the fact that clean water is itself a vital component of any anti-diarrhoea strategy. Because of this he recommends that the state should provide slum communities not just with information but also with a 24-hours-a-day clean water supply.



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