

Dialogue on Diarrhoea

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The international newsletter on the control of diarrhoeal diseases

Women and family health

Half of the people alive today are female. Yet still, in some societies, women's crucial contribution to human welfare remains undervalued and little is done to ease their burden and to realise their potential. An appropriate number of healthy pregnancies, safer birth conditions and good infant and child care are the obvious foundations of family health. In progress towards greater prosperity, health is an important factor but the knowledge and the means to reduce health risks in the home and its surroundings still need to reach many more women. Cultural prejudice, lack of formal education and poverty can form effective barriers to prevent women from playing a full part in the development process.

Traditional tasks

Throughout most of the world, women not only bear and rear the children and carry out all household tasks but, in rural areas, they are also responsible for growing food for the family and crops for cash, for carrying home, often over considerable distances, all water and firewood — and for maintaining whatever form of sanitation exists. Their hours of work are long (see diagram on page 3) and leave little time or energy for much else beyond sheer family survival.

Measures to improve family health must be designed with the above constraints on women's time in mind. For example, immunisation and growth monitoring sessions should take place

at times and locations convenient to mothers (see supplement on immunisation in this issue). Where fuel is known to be scarce or expensive, advice about giving suitable oral rehydration fluids should stress the importance of the speed of response to diarrhoea rather than the use of boiled water. (Page 6 suggests useful alternatives to boiling for water purification.)

Women and water — key role

Family health very much depends on the quality and quantity of water availa-

ble for family use. This issue looks at the key role of women as water handlers in the home and the community, the beneficial impact that water supply improvements can have on diarrhoeal disease and primary health care in general, the potential for women to manage water-related technologies themselves and to act as health educators and agents of behaviour change. *DD* gratefully acknowledges special support for this issue from the Carnegie Corporation of New York.

KME and WAMC



Photo by Andrew M. Prentice

Women play a key role in family health in addition to their many household and economic responsibilities.

In this issue . . .

- Women, water supply and sanitation
- Immunisation insert

AHRTAG

Appropriate Health Resources &
Technologies Action Group Ltd

'A Handle on Health'

'A Handle on Health', a new film produced by the International Development Research Centre (IDRC), shows projects actively involving women and the community in the delivery of safe water in Ethiopia, the Philippines, Sri Lanka and Thailand. The film demonstrates how simple, durable handpumps can be designed, tested and manufactured with low cost materials, as well as providing employment opportunities and saving scarce foreign exchange. It is available in English and French, and 16mm prints may be borrowed or purchased. Video cassettes in NTSC, PAL or SECAM signal systems may be purchased in U-matic, VHS or Betamax formats. For further details please contact: *IDRC Communications Division, PO Box 8500, Ottawa, Ontario, Canada K1G 3H9.*

Award to DD Editor

Dr. Katherine Elliott, Scientific Editor of *Dialogue on Diarrhoea*, received the 1987 National Council for International Health (NCIH) International Health Award on 17th June 1987 in Washington D.C. The award is given annually to an individual who has made an outstanding contribution to global health. Dr. Elliott's work in founding and editing *DD* was highlighted as a notable achievement.

AIDS Newsletter

AHRTAG will shortly be publishing a new newsletter about AIDS. Readers who would like to be on the mailing list should write to AHRTAG at 85 Marylebone High Street, London W1M 3DE, U.K. The newsletter will be distributed free of charge to subscribers in developing countries and copies will also be available in bulk.

Poster competition

So far we have received nearly 100 entries for the children's poster competition announced in *DD* 29. To give children some extra time to send in their posters, the deadline for receiving entries has been extended to 1 January 1988.

In the next issue . . .

DD will look at the problem of diarrhoeal diseases in urban areas.

Training materials

The International Training Network for Water and Waste Management (ITN) has produced a comprehensive collection of training and information materials on low cost technologies and approaches based on studies of the World Bank and other agencies. For further details please write to: *Mr Michael Potashnik, Office of the Training Coordinator, Water Supply and Urban Development Department, World Bank, 1818 H Street, NW, Washington D.C. 20433, U.S.A.*

Feedback on ORT

The Hesperian Foundation is asking for help in gathering material for a future publication to be called "The Return of Liquid Lost — putting oral rehydration in the people's hands and terms." The Foundation would like feedback from people in the field, especially those working at the community or village level. Any information on the following topics would be especially welcome:

- comparison of different approaches (e.g. ORS packets or home mix, and cereal based ORT);
- traditional methods of diarrhoea control, local beliefs or practices;
- problems, reasons for success or failure of community programmes;
- educational methods and materials, especially those that are adapted to local circumstances, resources, and traditions;
- involvement of school teachers, children, women's organisations, political groups, agricultural extension workers in ORT promotion and implementation;
- examples of results of participatory research and evaluation;
- observations and results of introducing ORT as a separate programme, as part of a package of selected interventions, or as a part of a comprehensive plan or intersectoral approach;
- ideas and suggestions for more effective approaches to ORT (including those within the context of primary health care and social change).

Please send any comments, reports, or contact names to: *David Werner, The Hesperian Foundation, PO Box 1692, Palo Alto, California, 94302, U.S.A.*

Publications

• The International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B) has published an **Annotated bibliography on chronic diarrhoeal diseases: Specialised Bibliography Series No. 11** and an **Annotated bibliography on water, sanitation and diarrhoeal diseases: roles and relationships: Specialised Bibliography Series No. 12**. For further details please contact: *ICDDR,B, GPO Box 128, Dhaka 2, Bangladesh.*

• A new booklet, **The treatment of acute diarrhoea: information for pharmacists** has been produced by the WHO/CDD programme and the Federation Internationale Pharmaceutique. For further details please contact *WHO, CDD Programme, 1211 Geneva 27, Switzerland.*

• A study, supported by the WHO/CDD Programme, **Options for Diarrhoeal Disease Control: the cost and cost-effectiveness of selected interventions for the prevention of diarrhoea** has been published by the Evaluation and Planning Centre for Health Care (EPC). Copies are available from: *EPC, London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, U.K. Price: £5.00 including postage and packing.*

• An African version of **Where there is no doctor: a village health care handbook** is now available from *Teaching Aids at Low Cost (TALC), PO Box 49, St. Albans, Herts. AL1 4AX, U.K. Price: £2.50 plus postage and packing.*

• The Caribbean Food and Nutrition Institute (CFNI) (PAHO/WHO) in collaboration with the Ministry of Health, Jamaica has produced a **Nutrition handbook for community workers in the tropics**. Published by MacMillan the handbook is available from *TALC. Price: £1.75 plus postage and packing.*

• A new edition of **Medical Laboratory Manual for Tropical Countries, Volume 1** by Monica Cheesbrough is now available from *Tropical Health Technology, 14 Bevills Close, Doddington, March, Cambridgeshire PE15 0TT, U.K. Price: £8.55 for surface mail and £14.05 for airmail.*

The role of women

Preventing diarrhoea in young children requires more than the provision of safer drinking water and improved sanitary facilities. Mary Elmendorf discusses the important role of women in family health and hygiene.

The availability of safe drinking water in sufficient quantities and sanitary disposal of human excreta are essential for basic health and can help to reduce deaths from diarrhoeal diseases. Proper use of improved facilities is the first priority but it is also important that the faecal-oral route of infection and reinfection is understood, otherwise loss of life among young children from diarrhoea-associated illness and malnutrition will continue at a high level.

Community involvement

Water supply and sanitation projects must be planned and implemented with the full involvement of those who are going to use the facilities. Particular recognition should be given to the importance and diversity of the role of women in these activities. In most cultures women carry out various tasks in relation to domestic water and household sanitation:

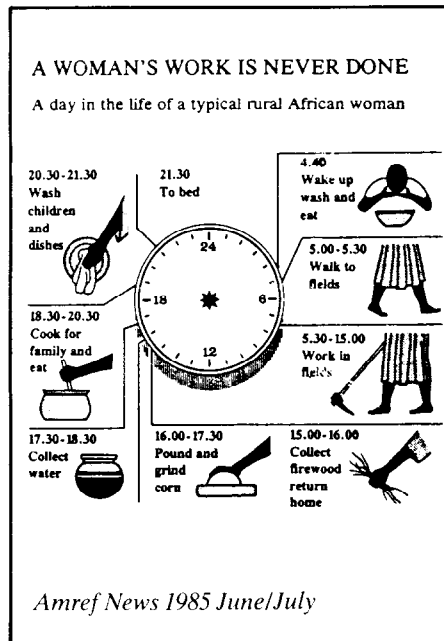
- as acceptors of technologies — traditional and new;
- as users of improved facilities;
- as managers of water supply and sanitation programmes;
- as agents of behavioural change in the use of improved facilities¹.

Women benefit from water supply and sanitation programmes through savings in time and energy. Experience has shown that they are the main users and managers of water resources and the main influence on family sanitary habits. They are therefore most able to bring about changes in basic hygiene behaviour in daily activities. Given appropriate training, support and equipment, women can help to break the faecal-oral cycle of infection.

Information and equipment

Even though the faecal-oral reinfection route is well recognised, little has been done to design facilities and effective health education to help spread this knowledge. All mothers need basic information, and equipment such as

soap and hand basins, adequate containers for carrying and storage of water, and conveniently located, safe



latrines (or their equivalent). Water alone does not bring sanitation or health. Nor do latrines. Nor do both if families do not wash their hands after using the latrine. As more water is made available from pumps or standpipes, appropriate containers and proper use or reuse of water will be needed to increase health impact. Along with the introduction of improved community facilities there should be provision for new and appropriate household equipment to maximise effective use. If there is only one bucket and no money to buy another, of course it will be used for everything. If there has been only a little water available, the same water may be reused for washing clothes, dishes and vegetables. If latrines are not appropriately designed to fit customary habits, they will not be used. If use of latrines is followed by handwashing their positive health impact can be greatly increased.

Questions to be asked

Certain questions also need to be asked and answered. When women have always washed their clothes in the running stream, will they need, want or use piped water? If water is being used for laundry and bathing, can it be reused in an aqua-privy? Do we only think of bathroom planning for elite urban areas? How can water for handwashing be made easily available at the latrine? How can people be successfully motivated to adopt hygienic practices such as handwashing? How can hands be washed adequately using a minimum of water? A minimum of soap? No brushes? How can hands be dried after washing? What are the usual local behaviour patterns? Can there be more dialogue with the women to find out how and where they wash clothes, dishes, hands, children, and themselves? All of these activities (or lack of them) can be part of the reinfection route unless precautions are taken. For example, there is the common belief that children's faeces are 'harmless'. They are **more** infectious than adult excreta and can contribute to reinfection if they are left in the yard, thrown on a nearby garbage heap, or if soiled baby clothes are washed along with dishes.

Prevention and cure

During the last five years oral rehydration therapy (ORT) has become the main weapon in the treatment of dehydration (which accounts for at least 60 per cent of the deaths from acute diarrhoea). Early and adequate use of ORT depends primarily on women. But ORT is only a curative solution; it does not prevent diarrhoea. One long term answer to preventing diarrhoeal disease is improved hygiene — personal and environmental — both within and outside the home. The women who have been shown how to use ORT also play key roles as daily managers of water and sanitation in their homes. They can become the agents of behavioural changes needed to lower the incidence of recurring diarrhoeal disease.

Dr Mary Elmendorf, 2423 Eye Street, N.W., Washington D.C. 20037, U.S.A.

¹ *Elmendorf and Isely, 1981*

A stimulus to PHC?

Does improving a community's water supply help to increase participation in other primary health care activities? Some operational research findings suggest that it may do.

Researchers from the University of North Carolina looked at the effect of community participation in water supply projects in Indonesia and Togo¹. The study was based on the assumption that water supply projects which meet a felt need and involve the community in their design, construction and operation have an impact on the organisation of the community and its capacity to take advantage of other health care services. Level of immunisation coverage for the community was used as the indicator of participation in other primary health care activities.

The relationship between community participation in a water supply project and increased use of other primary health resources may be for two reasons. First, where a community becomes organised as a result of a rural water supply project, the process of organisation itself leads to the community making better use of other primary health care facilities and resources already available. Second, where a water supply substantially reduces the amount of time women spend in water collection, more time is available to mothers to participate in other primary health care activities. One Togolese woman remarked 'Now that we don't have to spend time carrying water, we have time to discuss what to do about our village'.

Community participation

In the study, a project was defined as 'participatory' when community involvement goes beyond donation of land, labour and materials to active involvement of men and women in decisions related to the planning, implementation, funding, maintenance and evaluation of a water supply project.

The selection of the sites was based on community water supply projects

that had been in use for at least three years and where similar nearby areas remained unserved (and where an immunisation campaign has been undertaken in both the served and unserved areas). The research project collected information from the two communities and compared them.

Results from Togo show that villages involved with community-based rural water supply projects have an average DPT (diphtheria, pertussis and tetanus) completion rate of 54.5 per cent among children aged 12-36 months. In villages with non-community based water projects the average rate is 39.8 per cent. In Indonesia, the DPT completion rates among children aged 3-14 months in the participatory and non-participatory water supply villages are 60 per cent and 49 per cent respectively. The study found that effective community participation requires about four months of preparation with the community. The follow-up phase of this activity will examine knowledge of ORS in communities with varying levels of participation.

¹ *"Community Participation in Water Supply Projects as a Stimulus to Primary Health Care: Lessons Learned from AID-supported and other Projects in Indonesia and Togo."* by E. Eng, J. Briscoe and A. Cunningham. WASH Technical Report No. 44.

Readers are welcome to request these studies from WASH, 1611 N. Kent Street, Room 1002, Arlington, VA 22209, U.S.A.

Hygiene education

Does teaching people to use improved water and sanitation facilities effectively reduce childhood diarrhoea? Bonita Stanton and John Clemens report from Bangladesh.

Uncertainty about the usefulness of teaching hygiene is the result of using inappropriate water and sanitation educational interventions in the past. These have often included too many messages, about behaviour which is culturally unacceptable or too costly, and recommending actions that have not

been shown to reduce diarrhoea rates.

In Dhaka we planned to find interventions that were already being used effectively and to teach about these. We looked at this in two ways. First we compared the hygiene practices in families with high and low child diarrhoea rates (a case-control study). Second we trained one group of families in the domestic practices associated with less diarrhoea and compared the improvement with the state of health in untrained families (a controlled trial).

We looked at current practices of washing and sanitation which appeared to influence the number of attacks of childhood diarrhoea in slums in Bangladesh. These would form the basis for simple education interventions, that is, appropriate teaching messages. We studied approximately 1,900 families, in 51 clusters of 38 families, throughout Dhaka city. Each cluster was located near a volunteer community health worker from the Urban Volunteer Programme of the International Centre for Diarrhoeal Disease Research, Bangladesh (ICDDR,B). The rates of diarrhoea of all children under six years of age in these families, and the hygiene practices of a 13 per cent sample of these families were monitored between October 1984 and January 1985. After ensuring that the numbers and ages of children were similar, the families were ranked from highest to lowest according to rates of diarrhoea. Families with the highest diarrhoea rates, the top 25 per cent, were chosen as "cases" and families with no episodes of diarrhoea in the study period as the "controls". The social structure and the economic status of the case and control families were also checked to see if they were the same. The hygienic practices of the high-diarrhoea families were compared with those of the low-diarrhoea families. Of many practices observed, only three differentiated the high-diarrhoea from the low-diarrhoea families. First, fewer case mothers (53 per cent) than control mothers (82 per cent) washed their hands before serving food. Second, more toddlers of case families (80 per cent) than of control families (33 per cent) defaecated in the families' living area. Third, in more case control families (47 per cent) than in control families (30 per cent) children put garbage and waste products in their mouths.

Effectiveness of teaching

The three hygienic practices which were associated with less diarrhoea were taught to some families but not others. (This was a randomised controlled trial of hygiene education.) Since these hygiene practices were already being used by some families, we presumed them to be culturally acceptable and financially feasible.

The same 51 clusters of 38 families were used in this teaching study. A team of interviewers and observers collected information about diarrhoea and related practices for five months before and six months after the start of the hygiene teaching campaign. To make sure that the observations were systematic, the team used a list of specific actions to look for in all the families. The 51 community clusters were matched up in pairs for age of children and diarrhoea rates. Then one of each of the community pairs was selected in an unbiased way (random selection) for hygiene education. There were 25 communities chosen for "teaching" (intervention group) and 26 communities for "no teaching" (the control or no intervention group). In the teaching team were the 25 volunteer community health workers from the 25 intervention areas and also other trainers. Educational materials included stories with pictures, flannel boards with figures, before and after photographs, and 'do' and 'don't' pictures. The teaching went on for two months in 1985 and included discussions with groups of women, children and mixed audiences including men. After the teaching period, one of the hygiene behaviours, mothers washing hands before serving food, was seen significantly more often (49 per cent) in the communities where this had been taught than in control communities (33 per cent).

Episodes of diarrhoea

In the first six months following the teaching intervention there were 653 episodes of diarrhoea (a rate of 4.29 episodes per 100 person-weeks of observation) in the hygiene-taught intervention communities. By contrast, there were 914 episodes of diarrhoea in the control communities which had not been taught (a rate of 5.78 episodes per 100 person-weeks of observation). This difference was statistically highly significant ($p < 0.0001$), indicating that the

hygiene teaching had made a difference. This difference was seen in all age groups, but was most striking in the 2 and 3 year old children. This toddler age is when children are most vulnerable to diarrhoea in Bangladesh.

In summary these results show that simple educational messages designed to alter behaviours known to be associated with childhood diarrhoea really can change what mothers do.

Bonita Stanton, MCH Specialist, The World Bank, Resident Mission in Bangladesh, 222 New Eskaton Road, GPO Box 97, Dhaka, Bangladesh, and John Clemens, Epidemiologist, ICDDR,B, PO Box 128, Dhaka, Bangladesh.

Improved facilities

The effect of improved water supply and excreta disposal on infectious diarrhoeas in Malawi and the Philippines.

In Malawi, the environmental improvements in a rural area near Zomba are provided through the Rural Piped Water Supply and Hygiene Education Programme. This programme supports self-help gravity water supply systems for communities, and education about hygiene and latrine construction. In Cebu, improved water supplies are available through the municipal water system and public and private boreholes. Improved excreta disposal facilities (flush toilets, water-sealed toilets or pit latrines) are available to two-thirds of this peri-urban population.

Clinics were selected to include families attending who had improved environmental conditions and those who did not. Children were categorised as 'exposed to good environmental sanitation' if their families had an improved water supply and improved excreta disposal facilities; all other children were considered 'not exposed'.

The studies were based on children brought to the same clinics for one of several diseases considered to be of similar severity to diarrhoeal disease. Control diseases were mainly malaria and acute respiratory infections in

Malawi, and acute respiratory infections in the Philippines.

Although both studies were based on children attending several clinics (3 in Malawi, 16 in the Philippines), neither met the desired sample size (460 cases and 460 controls) since recruitment was limited to the 4-5 month periods corresponding to the warm-weather diarrhoea peaks in each location. Data were collected both at the clinic and in follow-up home visits. Additionally, in the Philippines study, rectal swabs were collected and analysed for all cases and controls for rotavirus, *Campylobacter*, *enterotoxigenic E. coli*, *Salmonella*, *Shigella* and *Vibrio cholerae*.

Impact of environment

The effects of improved water supplies and excreta disposal on diarrhoea morbidity were assessed. Results suggested that environmental improvements are associated with a reduction in diarrhoeal disease of about 20 per cent during the warm, rainy season for the particular populations studied.

For the Philippines study analysis, cases were restricted to those children with clinical diarrhoea who were positive for any enteric pathogens examined, and controls were restricted to those controls who were negative for all diarrhoea pathogens. The measure of association between disease and environmental sanitation was markedly stronger than that found in the broader analysis, with a 40 per cent reduction in diarrhoeal disease associated with the environmental improvements.

There is evidence that, in some poor socio-economic conditions, single environmental improvements may be necessary, but are insufficient to affect health status. If this is so, then these two studies would indicate that additional activities promoting clean water supplies, good sanitation and hygiene education could result in substantial health impacts.

Beverly Young and John Briscoe, Department of Environmental Sciences and Engineering, School of Public Health, University of North Carolina, Chapel Hill, NC 27514, U.S.A. and Jane Baltazar, Department of Epidemiology and Biostatistics, Institute of Public Health, University of the Philippines, 625 Pedro Gil, Ermita, Manila, Philippines.

Water purification

Most surface water — from rivers, streams and ponds — needs to be purified before it is fit to drink, as it may be contaminated with soil, decayed vegetable matter, and human or animal faeces. Drinking contaminated water is a major cause of diarrhoea. This article briefly describes various ways in which water can be purified. The four most common methods of water purification are:

- storage;
- filtration;
- chemical disinfection;
- boiling.

Storage

Contaminated water can be made safer to drink if it is stored for at least two days. Within that time many harmful organisms will die, and most of the dirt will sink to the bottom of the pot. But this will not kill **all** pathogens and is not effective for very dirty water.

Storage containers can be made of metal, glass, plastic, or glazed ceramic materials. The use of earthenware pots should be avoided if possible, because of the risk of bacterial growth in the porous clay walls. Water can be purified by storage in the home using three pots. Two big pots are used for fetching water on alternate days. The first pot is allowed to stand for two days. Then the clear top water is carefully poured into another (smaller) pot for drinking. The remaining water can be used for washing. When the first pot is empty it is cleaned and refilled, then it is allowed to stand for two days again. Meanwhile the second big pot is used in the same way as the first. In this way each day's drinking water has been standing for at least two days before it is used. Storage containers must be covered to prevent the water from becoming contaminated, to stop algae from growing and to prevent evaporation.

Filtration

A sand filter will remove most of the suspended organic material in water, but it will always let viruses and some bacteria pass through. For this reason, it is best, if possible, to boil or chlorinate water after it has been filtered.

Household sand filter — Using wide, earthenware pots, about 750mm high, 1 litre of water can be filtered every minute. Inside the pot put a thin layer

of small stones. Cover this layer with a layer of charcoal, over which put a thick layer of sand. Another layer of gravel can be put on top to stop the sand from being disturbed when water is poured in. The filtered water passes through a tube from the bottom of the filter pot into a collecting vessel. A similar version can be made from three or four clay pots standing on top of each other. The pots, in turn from the top, contain gravel, and charcoal. In the four-pot version the lowest pot is used for storage of the treated water. The filter is simple to make using local materials, and can be kept working well by occasionally removing the top layers and replacing them with fresh gravel and charcoal.

Chemical disinfection

Iodine — Iodine can be used for disinfecting water and is excellent provided the water is not too dirty. WHO recommend two drops of 2 per cent tincture of iodine per litre of water. If the water is thought to be highly polluted then the amount should be doubled — such amounts are not harmful but will give the water a slightly medicinal taste. Iodine compounds, such as tetraglycine potassium tri-iodide are supplied as tablets which are claimed to be effective against amoebic cysts, and some viruses and bacteria.

Chlorine — Chlorine is a good disinfectant for drinking water as it is effective against bacteria associated with water-borne diseases. Bleaching powder contains about 25-30 per cent chlorine. (**WARNING: Keep all kinds of bleach away from children and out of eyes. Do not swallow.**) About 37cc (2½ table-spoons) of bleaching powder dissolved in 0.95 litre (1 quart) of water will give a one per cent chlorine solution. To chlorinate the water, add three drops of one per cent solution to each 0.95 litre (1 quart) of water to be treated (2 table-spoons to 32 imperial gallons), mix thoroughly and allow it to stand for 20 minutes or longer before using the water.

Alternatively, simple chlorinators, which dispense chlorine at a constant rate into a water supply, can be bought or made with local materials. An example is a diffuser chlorinator which is used in non-flowing water supplies like wells, cisterns and tanks. It consists of a

pot filled with coarse sand and chlorine powder, submerged in a water supply. The chlorine seeps into the water supply through holes in the container. Diffuser chlorinators have slow rates of disinfection and are most effective in wells or tanks not producing or holding more than 100 litres/day.

Boiling

Boiling is the best way of destroying germs in water. The water must be brought to a good 'rolling' boil (not just simmering) and kept boiling for ten minutes (this may need to be longer at high altitudes). Store the water in the container in which it has been boiled, or, if pouring the water into another container make sure that it is clean. There are certain issues to consider when boiling water to purify it:

- Pathogen survival — some pathogens (E coli and faecal coliforms) and cysts such as giardia lamblia may be killed at lower temperatures than boiling point (about 50 - 64°C rather than 100°C).
- Cost — boiling water for ten minutes or more may be impractical where fuel is expensive or difficult to obtain. Boiling and cooling water also takes time.
- Recontamination — unless boiled water is carefully stored and used, it may be recontaminated by dirty containers, insects, dirty hands etc.

Other methods

Other methods have been used to purify water with differing levels of success. These include using sunlight, alum, ash, clay and traditional materials such as seeds and plants. Some studies have shown that exposing water to sunlight for several hours in a transparent container can reduce the number of enteric pathogens. A recent study in Bangladesh showed that potash alum prevented bacterial growth in ORS solution when used in a concentration of 0.05-0.1 per cent. More research is needed to study traditional and alternative methods of purifying water. The Editors would welcome letters from readers about their own experiences of treating water using traditional methods.

For more detailed information about the methods of water purification described above, please write to Dialogue on Diarrhoea at AHRTAG.

Bangladesh: the Mirzapur project

The project began in 1984 at Mirzapur, 60 km north of Dhaka, in an area with approximately 800 households and 4,500 people. Interventions include installing handpumps and double-pit latrines, and a health education programme. A similar population 5 km away where no intervention was made serves as a control group. The project is field-testing, in a rural setting, a newly developed handpump (the Tara pump). It aims to assess the acceptability of the water and sanitation hardware, and to measure the impact on health, particularly nutritional status, diarrhoea, and intestinal worm infestations in children.

The Tara handpump

The Tara handpump is a locally manufactured, non-suction, low lift pump made mostly of plastic components. It can extract water where the static water table has fallen to a level at which conventional suction pumps become inoperative (about 7 m), and could be used in all areas in the delta regions of Bangladesh. The pump is easy to operate, simple to maintain and provides good quality water in large volumes throughout the year. 156 Tara handpumps have been installed in the intervention area. Together with some UNICEF No. 6 pumps already in place, this makes the borehole to population ratio about 1:30. In the control area, previously installed UNICEF pumps each serve approximately 110 persons.

To begin with all Tara pumps were maintained by project staff; now 30 pumps are maintained by trained community women volunteers. They are checked once a fortnight and on average have been found to require 4 to 5 minor repairs a year. Water consumption per person varies according to the number of people using the pump. Water use per person is much higher when pumps serve 20 persons or less than larger numbers. Since the project began, use of handpump water for most domestic purposes has increased significantly in the intervention area, whilst remaining at the same level in the control area.

Double-pit, water-sealed latrines have been installed in more than 95 per cent of households in the intervention area.

Departing from traditional practices, these were placed close to the households, and so were less readily accepted by the community than the water component of the project.

Women as health educators

At first health education was conducted through project staff only. In 1985, however, this was gradually transferred to women volunteers from the community. During 1986 women from 25 per cent of households were trained as health educators and it is hoped that women from all households will be participating by the end of 1987. Health education messages have been periodically reviewed and modified. Detailed weekly recall data on diarrhoea in all age groups, quarterly nutritional measurements and yearly parasite prevalence data in children under five years of age are being collected. Socio-economic status, water consumption, latrine and handpump performance, and knowledge, attitudes and practices relating to water and sanitation are also being recorded. During the study period the incidence of diarrhoea in children below five years of age has decreased in both areas but substan-



ICDDR, B photo by Asem Ansari

The Tara handpump

tially more so in the intervention area. The project is now starting its final phase and findings will be reported in 1988.

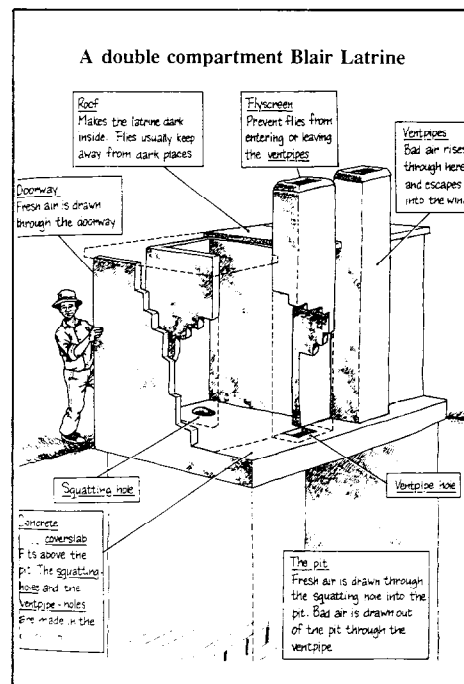
Dr Bilqis Amin Hoque and Dr K M A Aziz, International Centre for Diarrhoeal Disease Research, Bangladesh, GPO Box 128, Dhaka 2, Bangladesh.

Zimbabwe: encouraging families to build latrines

The government in Zimbabwe is encouraging families to participate in constructing and maintaining ventilated pit (VIP) latrines, to improve sanitation in rural areas. The Blair ventilated latrine is very popular because:

- it does not smell
- it does not attract flies
- it is safe to use
- it is very private
- it costs little to build
- it can be used as a private bathing place
- it is easy to maintain and lasts for many years

Ministry of Health, Box 8204, Causeway, Harare, Zimbabwe



Training medical students

The rural Ibarapa Community Health Programme in Oyo State, Nigeria, is the public health and primary health care training site for fourth year University of Ibadan medical students. In September, 1985, a model ORT unit was established at the Igbo-Ora Rural Health Centre, with assistance from UNICEF Nigeria. Before setting up the ORT Unit, medical students surveyed diarrhoea prevalence, and gathered valuable cultural and behavioural information which forms the basis of the Unit's health education services. All students must, during their eight-week posting in Ibarapa, conduct epidemiological projects. In carrying out diarrhoea surveys, the students not only learn research and statistical methods, but also gain insight into the problems of diarrhoea and its management. They found that almost all mothers recognised diarrhoea as increased frequency of watery stools, and that teething, bad food and dirty stomach were most commonly believed to cause the disease. They learned that while nearly two-thirds of mothers had heard of salt-sugar solution (SSS), less than one-fifth actually considered it as first line management for diarrhoea. Changes in feeding patterns during diarrhoea were also noted, with beans being forbidden during diarrhoea and bland maize porridge being preferred.

Dialogue with mothers

Once the ORT unit was functioning, students worked on a rota basis. They now take part in assessment of children brought to the unit, giving ORS, monitoring progress, and above all in health education. An interactive health education process has been developed and adapted UNICEF posters are used as a basis for discussion with mothers. Mothers' ideas are sought and their existing knowledge built upon to help them gain a greater understanding of the problem. For example, when mothers say teething causes diarrhoea, staff members ask questions about the

child's behaviour during teething. From this discussion, mothers realise on their own that a teething child puts all manner of dirty objects into its mouth, thereby causing diarrhoea. Step by step, mothers are guided through simple ideas about recognition, cause, prevention, dangers and treatment of diarrhoea. They then take part in a demonstration of making home SSS. The medical students also take ORT education into the community. They discuss the problem of diarrhoea with children during the regular school health lessons, and with community members during weekly PHC village supervisory visits.

Recently a group of students has conducted a survey on risk factors. They found that all mothers believe in hand-washing, but that children whose mothers use both soap and water have less diarrhoea than where water alone is used. The visible presence of children's faeces in the immediate home environment was associated with higher diarrhoea prevalence. Users of well water reported more diarrhoea in their pre-school children than those with access to tap water.

Although all medical students have heard of ORT and SSS prior to coming to Ibarapa, few know the correct formula for home made solution, its main purpose and the means of administration. Post-test results at the end of the posting show that virtually all can make the drink correctly and understand its efficacy. During the early days of oral therapy for diarrhoea, one of the major problems was acceptance of the idea by health professionals. If up and coming generations of physicians (and other health workers) participate in ORT programmes during their basic training, they will hopefully grow to accept ORT as a natural and desirable part of diarrhoea control and primary health care.

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Motivating pharmacists

We have a particular problem in Egypt in our ORT programme. When a child develops diarrhoea, many mothers do not consult a health facility or private physician, but, for economic reasons, go directly to a pharmacy asking for medicines to treat diarrhoea. The pharmacist most likely gives the mother 2-3 medicines and ORS is not always one of them. The motives are financial as selling more medicines brings more income. In any training programme, pharmacists should be included, motivated and in one way or another given compensation for lost income from not selling conventional "antidiarrhoeal drugs". In Egypt one method used is to supply free of charge special containers for preparation of ORS, which the pharmacists are allowed to sell to buyers of ORS, giving them an additional income. However, we are still very far from making all pharmacists advocates of ORS.

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Editors' note: Anti-diarrhoeal drugs are inappropriate, ineffective and sometimes dangerous for young children. Pharmacists should **not** sell these drugs to mothers for their children and compensating them for not selling them would therefore be inappropriate. Pharmacists need clear guidelines and professional information from pharmaceutical associations about the correct prevention and treatment of dehydration. In many countries, national pharmacists' associations have agreed to distribute ORS packets free of charge. Where this would cause financial problems for pharmacists, governments could pay a professional fee for acting as a distribution centre for ORS packets. (*See page 2 of this issue: WHO Manual for Pharmacists*).

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