

Diarrhoea Dialogue

ISSUE No. 5



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THEORY INTO PRACTICE

WHO and World Bank activities during the International Drinking Water Supply and Sanitation Decade.

“Water supply and sanitation development must be complementary and developed with all other aspects of primary health care programmes. This is the approach to the Decade which WHO has adopted.”

For these programmes to be put into practice, major changes in national policy and management are necessary, which at times may be difficult to achieve. One example of this is the need to strengthen community-based manpower if projects are to be self-reliant and self-sustaining.

While this approach may be easy to implement in some cases, in others it will not only require hard work but also the will to accept change. The importance of community involvement cannot be over emphasized.

Technical cooperation

WHO's technical cooperation with member states focuses on:

- the promotion and support of the development of national programmes.
- the identification and preparation of projects for subsequent funding by the World Bank and other finance institutions.
- the strengthening of national institutions and capabilities.

Specific aspects of cooperation include:

- helping to assess country situations.
- supporting countries in the development of Decade strategies to bring about health improvements.
- studying problems which may delay progress in the Decade and making recommendations for improvements.
- identifying, formulating and costing projects.
- strengthening health agency contributions and assimilating primary health care principles to the provision of water and sanitation.
- organizing “soft-ware” support in manpower, health education for community involvement, water quality surveillance and control, and the transfer of technology.

Monitoring and evaluating

WHO is helping to:

- monitor the Decade's implementation.
- report on developments for review by the participating agencies.
- coordinate the overall promotion of the Decade through the Steering Committee for Cooperative Action.

With the help of governments and UNDP resident representatives, WHO also operates a system to channel information and

requests for support from national programmes to donor countries and *vice versa*. WHO is also establishing a worldwide programme of information exchange and is considering the need for evaluation and applied research in support of the Decade.

WHO works mainly through its staff rather than through providing finance for equipment. Field staff cooperate with national organizations backed up by the six WHO Regional Offices and the Organization's headquarters. At the present time, there are more than 130 professionals assigned to about 90 countries.

Dr B. H. Dieterich, Division of Environmental Health, WHO, Switzerland.

“Water supply and sanitation projects must improve:

- the productivity and well-being of the beneficiaries
- the quality and quantity of water supply and sanitation
- the supply of water and waste disposal for commerce and industry.”

The World Bank Group finances projects on a loan and credit basis in developing countries among its member states. Its lending programme has quadrupled from an average of less than US\$200 million between 1970–1975 to an average of US\$750 million during 1979–1980. Sector investment levels in future years will probably exceed the 1979–1980 figure.

Project development

Investment projects must be well prepared, and supported by sound organization and finance. Project facilities must be appropriate, efficiently built and operated, and well maintained. In rural areas the community must be able to operate and maintain the new facility – with the necessary technical assistance from a support organization. Project beneficiaries should also receive health education and other basic health care – either from the project organization or other institutions.

The World Bank not only finances projects, but also:

- provides funds for the preparation of schemes by governments.
- provides technical expertise (with UNDP financial support) to assist governments in project design. Such projects usually emphasize the use of appropriate technologies benefitting the rural and urban poor.
- supports WHO both financially and through assistance with national health sector programming, health education, basic health care, community action activities and research, and evaluation of environmental health.
- coordinates with other agencies, such as UNICEF, in the development of projects to ensure that the organization best qualified in a specific area becomes responsible for the appropriate projects.

John Kalbermatten, Water and Wastes Advisory Unit, The World Bank, Washington, DC, USA.

In this issue ...

- WHO and IDRC research programmes in water supply and sanitation
- country profiles from Mozambique and Nepal
- appropriate latrines

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Disinfecting with sunlight

The potential risks in making up oral rehydration solutions with dirty water were discussed in *Diarrhoea Dialogue* 4. One possible way to overcome this problem is to use the well documented bactericidal properties of sunlight. In a recent letter to *The Lancet*⁽¹⁾ researchers at the American University of Beirut, Lebanon, reported experiments on one litre lots of ORS made up with chlorine free tap water and sewage.

The contaminated ORS was placed in sterile polyethylene bags, some of which were placed in direct sunlight, some in a room (natural and artificial light) and some in the dark. The initial concentrations of bacteria were typical of those which might occur if ORS was made up with water from a heavily contaminated open well or pond (coliforms and faecal streptococci around 10^4 per 100 millilitres). Zero coliform and *Strep. faecalis* counts were obtained in one and two hours respectively in samples stored in direct sunlight.

The temperature of the ORS did not rise more than 5°C after two hours in the sun and NaHCO₃ concentrations and pH did not change. After two hours in the sun the bags were stored indoors for one day and no regrowth of coliforms was detected. (Coliform reductions of only 80–85 per cent took place in the bags kept in the dark and in a room for two hours and, after one day additional storage, massive regrowth had occurred.)

These experiments confirm that two hours in bright sunlight in a transparent container will effectively disinfect small volumes of ORS. (Storage indoors or in a cupboard will cause an initial decline in faecal bacteria followed by a rise.) The practicality of this method of disinfecting ORS is doubtful. Do mothers in your community have the appropriate sealed, transparent containers and do they have somewhere safe to put the bottle in the sun? What happens on a cloudy day?

However, the options for disinfecting ORS in the home are few. Boiling is often not practicable and chlorine or iodine are typically unavailable. *Diarrhoea Dialogue* welcomes correspondence on these, or other methods of disinfecting ORS.

⁽¹⁾Acra A et al 1980 Disinfection of oral rehydration solutions by sunlight. *The Lancet* vol. 2: 1257–1258.

Teknaf

Very few studies have been undertaken to evaluate the impact of clean, accessible water supplies and sanitation on the incidence of diarrhoeal diseases in rural communities. Some of the difficulties associated with this kind of survey are discussed on pages four and five of this issue and we hope to consider the subject further in future issues of *Diarrhoea Dialogue*.

At Teknaf in southern Bangladesh, a clean water and sanitation intervention has been underway since June 1980. It is hoped that the programme will have a particular impact on the health of children under five. Sixty hand pumps have been installed in the intervention area, with about five or six families using each pump. The pumps are checked regularly to avoid unnecessary breakdowns. Project staff are studying the way in which villagers use the pump water.



A hand pump at Teknaf
Photograph by Denise Ayres

Eight experimental water sealed latrines are already in use in the intervention area and it is planned to supply one to each family during the next year. A health education programme promotes proper and continued use of the latrines. Locally made clay "potties" will be provided for small children who cannot use the adult-sized latrines.

Initial indications from the study of the effect of the intervention on the incidence of diarrhoeal diseases seem encouraging. A full evaluation will not

be available however until after the study is completed in June 1982.

If you would like further information about the Teknaf project, please write to Dr Mujibur Rahaman, ICDDR,B, PO Box 28, Dacca, Bangladesh.

Jamaican study

A recent paper in *The Lancet*⁽¹⁾ from members of the Department of Child Health, University of the West Indies, Jamaica raised several interesting points. Their study compared the composition of salt-sugar solutions prepared by 44 Jamaican mothers according to "current health education" and those prepared using a double-ended spoon.

The authors found that:

- the composition of homemade oral rehydration solutions is often dangerously wrong.
- the osmolality of the glucose/water solution was especially high because mothers prepared the solution according to taste – and in Jamaica people prefer very sweet and salty food.
- the two-ended spoon is useful in helping to improve the precision with which oral rehydration solution is made up. But there are difficulties in measuring unrefined sugar. A single spoonful yields a concentration of only 1–2 per cent.

Mothers have to be informed about the most accurate way of preparing homemade oral rehydration solution where WHO packets are hard to obtain, and in Jamaica local radio and television have proved invaluable in passing on the message.

⁽¹⁾Harland P S E G et al 1981 Composition of oral solutions prepared by Jamaican mothers for treatment of diarrhoea. *The Lancet* vol. 1: 600–601.

Requests for reprints should be addressed to P S E G Harland at the Dept. of Child Health, University of the West Indies, Mona, Kingston 7, Jamaica.

In the next issue ...

- the relationship between nutrition and diarrhoeal diseases
 - encouraging sick children to eat
 - practical advice on breastfeeding
- Diarrhoea Dialogue* 6 will be available at the end of August 1981.

Water supply and sanitation programmes

Sandy Cairncross and Colin Glennie report from Mozambique and Nepal.

Nepal

In the hills of Nepal women and girls must walk for several hours up and down steep paths to collect water from invariably faecally polluted sources. As a result, there are minimal supplies of poor quality water in the home. Latrines are virtually non-existent; the village environment is contaminated and, in particular, the home surroundings are seriously polluted by children's excreta which are highly pathogenic and yet considered harmless.

Gravity water systems

In 1971, the government started a programme of constructing gravity water systems in small hill communities. The

most significant result was that women no longer spent hours collecting water and the programme stimulated demand all over the country. Despite many problems, a viable programme now exists where none existed before.

Nepal: using water from invariably faecally polluted sources UNICEF photograph



Mozambique

Mozambique's greatest advance in the water and sanitation sector has been in the construction of pit latrines. A country-wide campaign was launched shortly after Independence by the Ministry of Health and the "dynamising groups" – the local committees set up by Frelimo as organs of people's power.

During two weekends of voluntary work, hundreds of thousands of latrines were built. In cities such as Maputo, it thus became possible to dispense with the insanitary system imposed before Independence by which nightsoil buckets were collected by forced labour. In the countryside, the campaign has been consolidated by health education (given, for instance, to patients waiting for treatment at clinics) and by building public latrines for schools, social centres, etc.

In the communal villages, where

people who previously lived scattered in the bush are building a new life together, the vast majority of households already have their own latrines, which are being used and maintained. Some dynamising groups have even decided to pass a bye-law that each family must build their latrine before they start to build the rest of their new home.

Concrete slab

Some town dwellers have had difficulty in obtaining suitable materials to cover the pit. To overcome this problem the Ministries of Health and Public Works have developed a concrete slab costing less than 500 MT (\$US16).

The slightly conical shape makes it possible to eliminate the steel reinforcement on a slab 1.1 metres in diameter and less than 4 cm thick. The slabs are cast on top of each other to improve the curing of the concrete and to save space in the neighbourhood casting yard.

Water is most frequently supplied to

the communal villages by simple wells with hand pumps. There is no alternative to this method given the number of people for whom the government hopes to provide water over the next ten years.

Shortage of engineers

Mozambique suffers from a terrible shortage of engineers. Nevertheless, manuals and special courses have been devised which have permitted technicians with only six months training to design and build small dams, for instance, and water towers as large as 100 cubic metres.

Training is a major feature of the water sector in Mozambique, with a training centre recently set up in Maputo to produce over 200 junior technicians a year. Another programme planned for this year will train villagers to carry out simple maintenance tasks on hand pumps.

Sandy Cairncross, Ministry of Works, Maputo, Mozambique.

Environmental health: WHO and IDRC

WHO: A major strategy

“A vital long term goal is to develop the most effective methods of environmental intervention to reduce the transmission of diarrhoeal agents.”⁽²⁾

The WHO Programme for the Control of Diarrhoeal Diseases was established in 1978 with the ambitious goal of co-operating with countries all over the world in “. . . a major attack on the diarrhoeal diseases”⁽¹⁾. The two main aims are to:

- provide technical and managerial assistance to national health programmes, to enable them to apply *known* effective measures for the clinical management and control of these diseases.
- support research that is likely to lead to *new and improved* approaches for the treatment and prevention of diarrhoeal diseases.

Scientific working group

An *ad hoc* Scientific Working Group (SWG) on Environmental Health and Diarrhoeal Diseases Control was held in July 1979⁽³⁾. This group of experts reviewed in depth:

- the environmental basis of transmission of enteric pathogens.
- the effect of environmental interventions on diarrhoeal diseases.
- environmental technologies appropriate for the village level.
- behavioural aspects of environmental control of diarrhoeal disease.
- organizational issues in environmental control.

It also discussed priorities for further research in these areas, and noted that research needs were very varied and differed from much other diarrhoea-related research because they:

- were multidisciplinary.
- formed a continuum from basic research to applied, operational work.
- were often culture-specific.

Overall priorities

The recommendations of this Group have been taken into account in developing overall research priorities for the Programme. Two of the three SWGs that have since been set up to manage basic research – on bacterial enteric infections⁽⁴⁾ and viral diarrhoeas⁽⁵⁾ – have included among their

priorities a number of research needs relating to environmental health. These include:

- study of the transmission of bacterial enteric pathogens and of ways of interrupting their transmission through environmental interventions.
- study of the ability of different water and excreta treatment and re-use processes (especially those appropriate in developing countries) to remove enteric pathogens.
- development of methods of detecting viral agents of diarrhoea in different environments, and of the factors influencing their survival and transmission.
- evaluation of the efficacy of various disinfectants and other inactivating agents against viruses, once these methods become available.
- investigation of the overall adequacy of *E. Coli* as an indicator of the presence of bacterial and viral enteric pathogens in aquatic environments in tropical countries, and of the suitability of faecal streptococci as alternative indicator organisms.

Field research

The Programme is also pursuing field research directed specifically at the village level through SWGs established at each of the six WHO Regional Offices. Among the many research needs are studies of:

- the importance attributed by communities to water supply and sanitation and methods of mobilizing community participation in these projects.
- the relative effectiveness of different health education techniques for changing behavioural patterns related to water supply and sanitation.

Uttar Pradesh

In an area in Uttar Pradesh, India, where only limited development activity has taken place, four groups of villages have been selected for an intensive

five year study of the health effects of continuous, abundant and safe water supplies as opposed to traditional sources of water.

In one group, safe water only has been made available; in another, an adequate sanitation system has also been provided; in a third, no development has taken place but a health education programme dealing with personal hygiene and nutrition has been introduced; and in the fourth, no intervention has been or will be made. Diarrhoeal disease incidence and mortality are amongst the indicators being used to assess the health effects. But the task is complicated by the inevitable use of water sources other than those provided by the project.

Sudan

At the “*Blue Nile*” research and control project in Sudan, a vast and concerted attack is being made on health problems – mainly schistosomiasis, malaria and diarrhoeal diseases – linked to irrigation. At the same time as treatment and control measures are being strengthened in the project area, an effort is being made in one study zone to:

- determine disease transmission patterns.
- evaluate the cost and effectiveness of control strategies.
- assess the impact on agricultural productivity.

From 1984, new and proven strategies will gradually be introduced to cover the whole project area.

The WHO Programme for the control of Diarrhoeal Diseases is seeking to encourage work in this field and invites proposals for research. If you are interested, contact the Programme Manager, CDD Programme, World Health Organization, 1211 Geneva, Switzerland.

Michael Merson, Programme Manager, CDD Programme, World Health Organization, Geneva, Switzerland.

⁽¹⁾*Diarrhoea Dialogue 1980 No 1: 6*

⁽²⁾*Unpublished document WHO/CDD/80.2: 22.*

⁽³⁾*Unpublished document WHO/CDD/80.5*

⁽⁴⁾*Unpublished document WHO/CDD/BEI/80.2*

⁽⁵⁾*Unpublished document WHO/CDD/VID/80.2*

IDRC: Technology is not the bottleneck

“It is time that new faces and fresh ideas were introduced into the area of water supply and sanitation if any worthwhile changes are to occur in the coming decade.”

The decade 1981–90 has been declared by the United Nations as a period for intensive action in the field of water supply and sanitation. Apart from the unrealistic targets set by the 1977 Mar del Plata conference on water, there are several constraints which could severely jeopardize the major investments to be made in this sector during the coming decade. These include:

- the dominance of technological approaches planned by engineers who are more interested in design than in acceptance and proper usage of the technology.
- the lack of hygiene, health and educational programmes to prepare communities for acceptance of the facilities and ensure proper use after installation. As it is difficult to alter social behaviour over the short-term, educational efforts are necessary over many years.
- the little emphasis placed on making communities aware of the importance of improved water supply and sanitation to the overall quality of life, or of the link between contaminated water and poor disposal of human excreta on the one hand and diarrhoeal diseases and skin infections on the other.
- the ‘top-down’ approach taken by technically oriented water supply and sanitation agencies in developing countries and the lack of communication between themselves and the minimal contact with health, social and educational sectors.
- the shortage of manpower at all levels, from professional to village-level technicians.

These problems are aggravated by the outdated curricula and methods used in training institutions, the lack of community participation and the inability to recover costs and provide facilities through tariff schemes, resulting in an eventual failure to maintain the facilities once installed.

Shortage of manpower

The Health Sciences Division of the International Development Research Centre (IDRC), which has been heavily involved in supporting research activities in the water supply and sanitation field over the past six years, has recently reoriented its programme. It has become clear that technology alone is not the bottleneck. Cost, manpower, acceptance and maintenance at field levels are the crucial factors in the success of a chosen method or system.

In developing countries there is a severe shortage of the manpower needed to carry out research in this field, thus severely limiting the scope of activities. Therefore, projects supported in future are likely to have a greater service component than before. They will also involve personnel from different disciplines.

Current projects

The areas presently being developed with investigators and instructors in developing countries are:

The implementation and evaluation of water supply and sanitation technologies in rural and urban slum areas. The activities undertaken include sanitary and health components, maintenance and spare parts, acceptance and cost-effectiveness of the technologies.

Social and managerial aspects of water supply. Activities are under way to study effective tariff schemes and water-use practices. A lack of basic know-how continues to plague the planning, implementation and execution of water schemes.

Manpower development in 1980. Regional seminars were held in Malawi and Botswana on water supply and sanitation to review improved methods of water delivery and sanitation disposal with key personnel from planning and training institutes in Ethiopia, Kenya, Tanzania, Malawi, Lesotho,

Mozambique and Botswana. At these meetings, discussion took place on the broader aspects of education, acceptance and maintenance of water supply and sanitation programmes and the necessity of updating curricula in training institutions to broaden the approach in preparing new cadres.

Support for seminars to implement changes at country level has also been encouraged. The possibility is being studied of putting experts in training institutions to work with trainers in amending the curricula of their programmes.

Groundwater extraction and surface water treatment and delivery. Studies are under way in Panama, Ecuador and Thailand using simple and appropriate technologies to provide water of reasonable quality and quantity to small, rural communities. Emphasis is placed on maintenance and community participation.

Sociocultural factors. Projects are being developed in the Philippines and India to develop guidelines that can be used to obtain information on community attitudes towards new innovations in water delivery and disposal of excreta.

Continued investment

The Division's activities also include studies on varying aspects of diarrhoeal diseases and the testing of different delivery systems to supply oral rehydration salts to combat the effects of the diseases in the 0–5 age group. **The importance of improved water supply and sanitation in reducing morbidity and mortality among young children cannot be overemphasized.**

It is time that new faces and fresh ideas were introduced into the area of water supply and sanitation if any worthwhile changes are to be recorded in the coming decade. It must also be realized in developing countries and among donor agencies that the investment will be required over two or three generations if there are to be changes in acceptance and use of facilities.

Health Sciences Division, International Development Research Centre, P.O. Box 8500, Ottawa, Canada K1G 3H9.

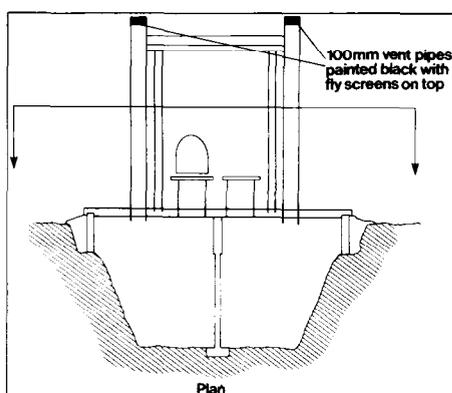
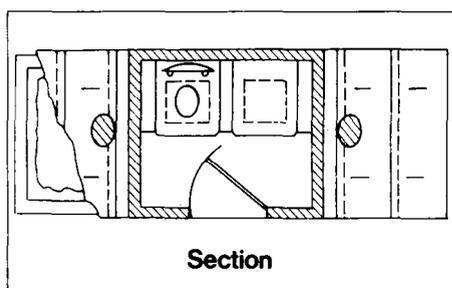
Appropriate latrines

Geoffrey Read describes two types of excreta disposal systems which are both affordable and appropriate for most developing countries.

There are some 2,000 million people in the world today who have no excreta disposal facilities. These will all have low incomes and are unable to afford piped sewerage. *It may also be technically inappropriate for them.* Alternative, well-proven technologies can be used and, if properly designed, they will safely dispose of excreta on site, while being both socially acceptable and affordable to the householder. The on-site excreta disposal technologies appropriate for most developing countries are the *Ventilated Improved Pit Latrine (VIP)* and the *Pour Flush Waterseal Latrine (P/F)*.

The Ventilated Improved Pit Latrine (VIP)

This latrine comprises a seat or squatting plate (depending on cultural preference) which forms part of a concrete slab over a large pit. The pit is ventilated by a pipe which is covered at the



VIP latrine (twin pit version)

exit by a non-corrodable insect-proof screen. The pipe removes odours and gases and is effective in controlling insects which breed in the pit. Removable concrete covers enable the pit to be emptied when full (pits fill at the rate of between 40 and 60 litres per person per year).

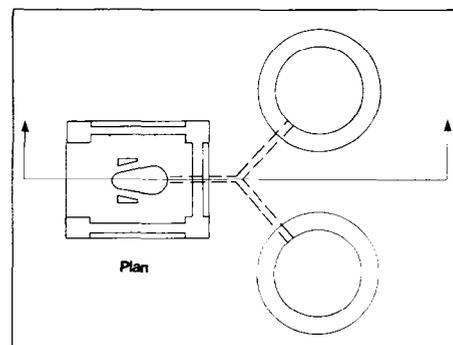
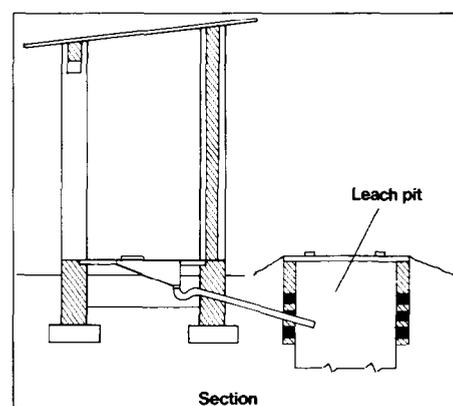
The preferred *VIP* design has twin pits which are used alternately. When one pit is full, it is rested, and the excreted pathogens die away over time leaving a rich humus. During this time, the adjacent second pit is used till full. Two years should be allowed to ensure that the contents of the first pit are pathogen-free. The first pit is then emptied and re-used and the second pit is rested. In this way the latrine remains in one position.

The householder can construct a building over the pit in any available – but preferably permanent – material. The pit cover slabs should not be constructed using wood, bamboo or other materials which will rot. In cases where the water table is high or the ground unstable it will be necessary to line the pit with brickwork or blockwork, ensuring that the lined pit remains porous.

The Pour Flush Waterseal Latrine (P/F)

This model comprises a squatting plate and pan over a water seal, connected by small diameter pipework to an underground leach (filter) pit. The preferred design has twin leach pits, which are used alternately as with the *VIP* latrine. Deposited excreta and urine is flushed away by manually pouring between two and three litres of water into the pan. The waterseal is thereby maintained keeping out odours, gases and insects. The leach pits are generally lined with honeycomb brickwork through which liquids filter away into the ground. The pits fill at about 30 litres per person per year, and are emptied alternately. In heavy clay soil or impermeable rock, the effluent will need to be piped away.

The *P/F* is most appropriate in Hindu and Islamic societies where water is used for anal cleansing. The *VIP* will give excellent service in situations where water is in very short supply. When planning sanitation programmes, existing socio-cultural practices must be carefully considered and the programme tailored accordingly. Provision should also be made for disposing of dirty wash water, either into a separate soakaway or into a piped or covered stormwater drain.



P/F latrine (twin pit version)

Latrines should be located as far away as possible from water supplies; if in doubt get professional advice. Health education, technical support and information programmes are essential components of sanitation development work. In particular, use by all the family must be ensured if the sanitation programme is to be successful.

The provision and effective use of affordable and appropriate excreta disposal systems will bring significant long-term health benefits to the millions of people presently living in unhygienic conditions and continually suffering from gastro-intestinal infections, high infant mortality and low life expectancy.

Geoffrey Read, World Bank/UNDP Technology Advisory Group (TAG).

Illustrations by Richard Inglis

Questions and answers

What are the most useful and easily available sources of potassium?

N. W. Pirie extends the discussion begun on this page in Diarrhoea Dialogue 3.

Bananas are undoubtedly a useful source of potassium (K⁺). However, it would be a pity if the tone of the article "Potassium losses and replacement in diarrhoea" (*Diarrhoea Dialogue 3*) gave the impression that there are not other good sources where bananas are scarce or expensive. According to that article, 30g of bananas supply 115 mg of K⁺: this agrees with analyses given in food tables. That amount of K⁺ would be supplied by 6g of defatted soy flour, 20g of lentils, peanuts or potatoes, and 30g of whole wheat flour or dark green leafy vegetables (DGLV). Most of the K⁺ is soluble in water.



WHO photograph by P. Almsy

Bananas are one useful source of potassium, but there are many others.

Consequently, soy flour should be toasted rather than turned into one of the commercial "soy felts", and DGLV should be steamed. For the same reason, if 30g of leaf is thought to be too much for a child, the water in which leaves have been boiled could be used. That procedure should be avoided if possible because 30g of DGLV would also supply the daily requirement of carotene (provitamin A) and it, unlike K⁺, does not come out into the cooking water.

In regions where diarrhoea is common, agricultural residues, dung or wood are the usual fuels. Few samples of wood ash contain less than 3 per cent K⁺. It is soluble in water, as is shown

by the old method of making lye (for soap) by dribbling water through wood ash. The necessary amount of K⁺ would therefore be present in the extract from 4 or 5g of ash. The ash from some fresh-water weeds, e.g. water hyacinth, is an even richer source. That contains 20 to 30 per cent K⁺^(1,2) and has sometimes been used in place of salt⁽³⁾. The ashes from several by-products of food plants contain similar amounts⁽⁴⁾. The conclusion is that, wherever land plants grow, there must of necessity be a supply of K⁺.

⁽¹⁾Finlow R S 1917 *Water hyacinth and its value as fertilizer. Government Printer, Calcutta, India.*

⁽²⁾Chokder A H 1968 *Further investigations on control of aquatic vegetation in fisheries. Agric. Pak. 19:101.*

⁽³⁾Schultz H 1962 *Brazil's big-lipped Indians. National Geographic Magazine 121 (1):118.*

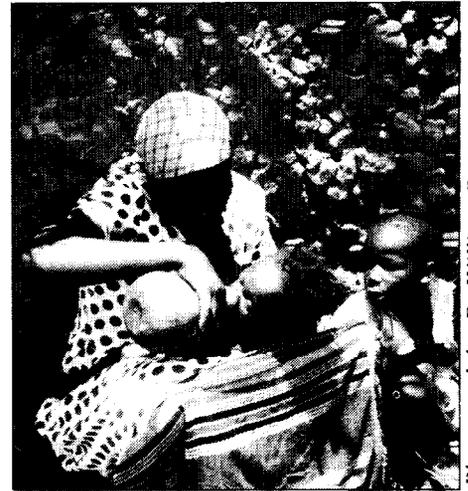
⁽⁴⁾Kuhnlein H V 1980 *The trace element content of indigenous salts compared with commercially refined substitutes. Ecology of Food and Nutrition vol 10: 113-121.*

Aspirin and diarrhoea

The use of anti-secretory drugs such as aspirin in diarrhoeal disease control programmes has been discussed in medical journals recently and several readers have requested a short comment on this. The role of therapeutics will be more fully examined in Diarrhoea Dialogue 8.

Diarrhoea usually results from excessive small bowel secretion or a failure of intestinal absorption. Various drugs reduce the rate of secretion, or enhance absorption, and aspirin is one of them. In a study carried out in Indonesia, 82 children with moderate or severe dehydration due to diarrhoea were given the same rehydration and supportive treatment. They were divided into three groups, one receiving soluble aspirin in a dose of 25mg/kg/day in divided doses, another a placebo and the third no additional treatment. The aspirin group showed significant decrease in stool volume and weight gain compared with the placebo group⁽¹⁾.

Reduction of faecal loss with such a well known drug as aspirin has immediate appeal. However, the authors of the Indonesian study indicate that the



Photograph by Dr William Cutting

Children with diarrhoea need rehydration, prevention of further dehydration and nutrition.

mechanism of aspirin's anti-secretory activity is unknown. They emphasise the need for further assessment of possible side effects even though they did not find gastrointestinal bleeding or metabolic acidosis in the 31 children who had aspirin. In addition, the study was performed under close hospital supervision which is unavailable to most children in areas where diarrhoea is common.

The dangers of overdosage and toxic effects of aspirin are real and using a "medicine" may detract from the more important and well-tested technique of oral rehydration to replace fluid losses.

⁽¹⁾Burke V et al 1980 *Reduction by aspirin of intestinal fluid loss in acute childhood gastroenteritis. Lancet 1: 1329-1330.*

Norbert Hirschhorn comments on another drug which has been shown to reduce intestinal secretion:

The use of anti-secretory drugs in a comprehensive diarrhoeal disease control programme has possibilities. For example, one study showed that chlorpromazine, in non-sedative doses, reduced stool output in a handful of adults with cholera⁽²⁾. However, these results cannot yet be generalized beyond the confines of the immediate study, and it would be dangerous to assume that drugs alone are sufficient treatment for diarrhoea. Children with diarrhoea need rehydration, prevention of further dehydration and nutrition.

⁽²⁾Babbani G H et al 1979 *Chlorpromazine reduces fluid loss in cholera. The Lancet vol 1: 410-412.*

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Finger-pinch method

I have been working in Nepal in general medicine and paediatrics. We have experimented with using a hospital ward as a rehydration unit, with a major emphasis on getting the relatives to make an oral rehydration solution themselves (rather than the nurses doing it all for them). We have used the finger-pinch method with good clinical results (though our measurements of the actual mass of NaCl and NaCO₃ showed that nearly always a much smaller amount was being used than WHO recommends).

From the little clinical biochemical information we had available we have been teaching that honey (fructose) is as effective as sucrose. During our diarrhoea season, which is the dry season from April–May, there is very little fruit available, and it is difficult to recommend a readily available source of potassium for use in the villages.

J.H. Sleggs, Thimpu General Hospital, Bhutan.

Editors' note:

N.W. Pirie has suggested some useful and easily available sources of potassium on page seven of this issue.

Technological approach

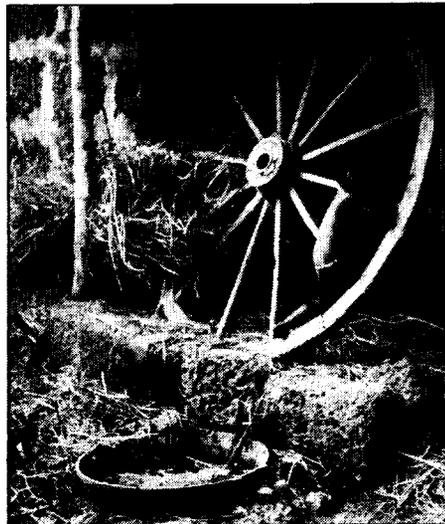
I enjoyed reading issue three of *Diarrhoea Dialogue* and found much useful information in it.

We are a comprehensive health service serving a large region of scattered, remote small Indian villages in northern Ontario. Due to poor socio-economic conditions, diarrhoeal diseases are common causes of morbidity though, fortunately, not of mortality. Being in a developed country, medical workers here tend to approach the diarrhoeal diseases in a technological manner – i.e. heavy reliance on intravenous hydration and mathematical precision in electrolyte balance.

T.K. Young, Medical Director, Sioux Lookout Zone Hospital, P.O. Box 1500, Sioux Lookout, Ontario, Canada POV 2T0.

Traditional water purification

I found the advice of Dr Kagimba (letters, issue four) not to resort to contaminated water and to use "weak tea" as a practical alternative very important. In southern India (Kerala and Tamil Nadu) people prepare boiled waters known there as "chukku vellam", "jeera vellam" or "malli water" which are spiced with the seeds of cumin (*Cuminum cyamum*), coriander (*Coriandrum sativum*) and sometimes also with dried ginger and some sugar. Some mothers insist that even healthy children should not drink "untreated water" before the age of ten. Spiced water is not "tasteless" like ordinary boiled water, cumin seeds are used for the treatment of chronic diarrhoea, coriander seeds are useful for dyspepsia and *Zingiber sp.* acts as a stimulant in cases of diarrhoea.



Drinking water is stored in a container on the ground outside this hut in India. Dirt falls into the water as children play around it.

If the water available is polluted surface water from rivers, ponds or shallow wells it should be treated first by traditional water coagulation. Details about such simple indigenous household methods and their scientific assessment are given in a manual entitled "Traditional Water Purification

in Tropical Developing Countries" which I recently compiled. It will be published by GATE (German Appropriate Technology Exchange, Eschborn, West Germany).

I am very interested in learning more about these practices, because what I have collected to date is far from complete. In case any readers of *Diarrhoea Dialogue* know something about local attempts at water improvement I would be grateful if they could write to me.

During a forthcoming pilot project on the implementation of improved water treatment methods at household level in Sudanese "model villages" I will ask my collaborators to incorporate teaching about treatment of children with diarrhoea in their "health education" on water treatment and hygiene. Especially during the rainy season when the incidence of gastrointestinal disease is much higher than at other times this will hopefully be a valuable supplement.

Samia Al Azharia Jahn, Water Purification Project, P.O. Box 2681, Khartoum, Sudan.

Critical information

What I like about your newsletter is that it highlights data that are all too often left out of "scientific" papers.

For example, the idea that children are not only the group most susceptible to and endangered by diarrhoeal infections but that they are also the most likely to spread the infection because of the less stringent taboos on where they defaecate (*Diarrhoea Dialogue* 4, page five).

A further example from issue four: the need for more "steal-proof" parts of hand pumps (page six). And finally, you are willing to face the "real world". Is it better to rehydrate with less than "pure" water or not rehydrate at all? Keep on with this kind of critically meaningful information.

Dana Raphael, The Human Lactation Center Ltd, Westport, Conn., U.S.A.

Editors: Dr William Cutting (U.K.) and Dr Katherine Elliott (U.K.)

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Executive editor: Denise Ayres

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