

Dialogue on Diarrhoea

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The international newsletter on the control of diarrhoeal diseases

Child survival — a universal concern

Concern today must be with more than the difference between life and death for children born in circumstances of poverty and deprivation. These children need not just to survive but also the chance to grow up healthy in both body and mind. It is the children of today who will be responsible for the

world of tomorrow.

Importance of education

Education is of paramount importance in influencing later hygiene and health behaviour. More than 1,300 schoolchildren from Europe, Asia, Africa and the Pacific region entered our poster competition. This excellent response shows how widely the causes of diarrhoea and

the place for ORT in treating it are coming to be understood by the parents of the future. The judges had a difficult task in choosing from so many good pictures. Thanks to the generous sponsors we will be able to send something to all entrants as well as the winners listed in the insert with this issue.

ORT — lifesaver but not a cure

There is no doubt that promotion of oral rehydration therapy has already saved the lives of many children, but it should be remembered that ORT does not prevent the problem of diarrhoea itself. Recent *Dialogues* have highlighted the importance of other measures to prevent diarrhoea such as immunisation against other infectious diseases like measles and the need to promote breastfeeding and good weaning practices. The possibility that vitamin A reduces the risk and severity of diarrhoea is discussed on pages 4 and 5.

In many places promotion of ORT should continue and extend. Nurses can play a key role in all countries in spreading the message about ORT and ways to prevent diarrhoea. Page 6 of this issue shows how nurses in a hospital setting in the U.K. work with parents to manage diarrhoea using ORT.

There is still no easy answer to the diarrhoea problem, but there are many ways in which people can help to protect their families. There are two pages of letters from readers in this issue; writing to *DD* is just one way to share ideas about what people can do about diarrhoea.

KME and WAMC



WHO photo

The parents of tomorrow — early education can establish healthy habits for life.

In this issue . . .

- Vitamin A and diarrhoea update
- Children's Poster Competition results
- Nurses and ORT in the U.K.

AHRTAG

Appropriate Health Resources &
Technologies Action Group Ltd

Iran: attitudes to treatment and use of antibiotics

Until recently, use of intravenous fluids has been a common practice in Iran. People have accepted it as a routine treatment and have often demanded it, not only for diarrhoea and vomiting, but also for headaches, tiredness etc.

Doctors' attitudes

Many doctors use ORS only to prevent dehydration or during the maintenance phase of rehydration therapy. Any dehydration is usually treated by IV fluids. Paediatricians, although well aware of ORT, do not always practise it without also using IV therapy. The government of Iran has started a popular campaign to promote ORT and is training health workers in this field. In my opinion, some doctors, who graduated during the 1970's or earlier, may also need a special re-orientation course because they can change people's attitudes effectively.

ORS packets are available at reasonably low cost. Unfortunately, as in other parts of the world, antibiotics and antimotility agents are very much over-used despite a campaign by the Ministry of Health.

Aetiology and antibiotics

In North Iran, we have conducted a study of children admitted to hospital with diarrhoea. This year, of the first one hundred cases analysed, 90 per cent had received unsuccessful treatment before admission with a variety of drugs, including antibiotics and antimotility agents.

Without facilities for identification and culture of viruses and campylobacter, definite aetiology could be established in only 38 per cent of cases; another 15 per cent (classified as parental diarrhoea) were associated with definite infection elsewhere (UTI, septicæmia, otitis, pneumonia etc.). Salmonella was found in 16 per cent of the stool cultures, 13 per cent showed pathogenic *E. coli*, eight per cent had *Giardia lamblia* and one per cent *Entamoeba histolytica*. The significance of the initial results of the study (which is still in progress) is not only the previously unreported high incidence of Salmonella infection, but also the

alarming level of drug resistance. To our surprise, all Salmonella cultures were resistant to ampicillin, 45 per cent were resistant to both ampicillin and chloramphenicol, and 38 per cent to chloramphenicol and co-trimoxazole. Similarly, all pathogenic *E. coli* cultures were resistant to ampicillin, 62 per cent were resistant to both ampicillin and co-trimoxazole, and 31 per cent were resistant to both ampicillin and gentamycine.

While ORT has been proved to be a simple, effective and inexpensive treatment for diarrhoea, there are many socio-cultural barriers to be overcome before it becomes popular and more widely used.

Dr R. C. Bhardwa is currently working in Iran.

The Editors would like to hear from other readers who have investigated antibiotic resistance.

Leaf concentrate consumption and diarrhoea

Given that leaf concentrate is one of the richest known natural sources of B-carotene (pro-vitamin A), its consumption may help to minimise the risk of diarrhoea. This has been reported by mothers in Find Your Feet's Mexican project, who stated that once their children started eating leaf concentrate routinely, they had fewer episodes of diarrhoea.

A number of studies have also shown that episodes of diarrhoea are less severe and less prolonged in well-nourished children. Regular consumption of leaf concentrate by children could thus be expected to ameliorate the effects of diarrhoea.

Treatment

As far as is known, leaf concentrate has not been added to ORT solutions or fed with them. One study, however, reports that feeding cooked pureed amaranthus leaves along with the standard ORT solution brought about a remarkable improvement in children treated with this mixture, attributed to the B-carotene in the amaranthus. If this is verified in further studies, it could be expected that leaf concentrate

(LC) would also be effective.

Potassium is frequently missing from home-made ORS solutions. To overcome this deficiency, it has been suggested that bananas be fed to children with diarrhoea. LC could also be effective since it contains almost as much potassium as bananas (320mg per 100g of LC versus 370mg per 100g of bananas).

Counteracting the effects

When a child has diarrhoea there may be a reduction in food intake and nutrient absorption lasting for a week or more, and resulting in faltering growth. Extra nutrients are needed for catch up growth: including an additional 10 to 15 grams of protein a day, for several weeks. Since leaf concentrate curd contains 25 to 30 per cent protein, its consumption during the post-diarrhoeal period may be recommended. It is soft and easily digested and can be taken before the diarrhoeal episode is completely over.

Walter J Bray, c/o Find Your Feet (UK) Ltd, 13-15 Frognal, London NW3.

For further information please contact the author.

Using ORS packets to measure water volume?

An accurately measured volume of water is important in preparing solution using ORS packets and in making sugar-salt solution. Programmes usually try to ensure this by:

- promoting the use of a commonly used and widely available 'standard' container;
- careful instruction of mothers and other users in how to measure a litre (or other volume) using a container which they have at home; or
- distribution of containers of standard size such as jars, cups, plastic bags to potential users.

All these methods require training and possibly the cost of producing and distributing a special container.

Why not use the ORS packet as a standard unit to measure the volume of water needed? Packets are usually made from water-resistant material and are sealed by the manufacturer to a standard size.



WHO photo

At the Hospital General de Oxapampa in the high central jungle area of Peru, we studied the ability of twelve mothers to use ORS packets to measure the correct volume of water. The mothers, who were mostly from poor homes, all came with children who had acute diarrhoea. After careful instruction they each tried to measure a litre of water four times and the volumes were all between 882 and 1058 cc⁽¹⁾.

If ORS packets were designed with measurement in mind, this might be a feasible method for measuring the water when preparing ORS solution with no additional cost⁽²⁾.

Dr O J Chang, currently at the London School of Hygiene and Tropical Medicine, Keppel Street, London WC1E 7HT, UK.

Editors' notes

1. At 882cc the sodium concentration would exceed 100 mmol/l which is higher than the recommended concentration of sodium.

2. This is one way of measuring a fluid volume, although as a method it has some weaknesses. Its practicability would depend on the local situation. At what level and how neatly it is opened will affect the volume of the empty packet. One concern is that multiple filling of the packet, presumably by dipping it, and difficulty in handling it, may result in greater contamination of ORS solution from the hands and environment than using a larger, more stable container. More operational research of this type in developing countries would be very useful. Readers are invited to send in comments from their own experience.

IDD newsletter

The most common result of iodine deficiency is goitre — a swelling in the neck caused by an enlarged thyroid gland. Children of iodine deficient mothers can be affected by severe physical and mental retardation, and cretinism. Approximately 800 million people are living in areas where they are at risk from IDD although it is most common in inland mountain countries of the Himalayas and the Andes. Indonesia, Malaysia and many African countries are also affected.

The Iodine Deficiency Disorders (IDD) newsletter covers all aspects of prevention and control of this important disease. Recent articles include community education programmes, discussion of disease and nutrition, and reports of iodinated salt distribution in Bangladesh, Java and Brazil. The journal is quarterly and available free of charge to readers in developing countries from *Dr J.T. Dunn, Editor, IDD Newsletter, Box 511, University of Virginia Medical Center, Charlottesville, VA 22908, USA.*

Note for readers

Please include your **mailing list number** (printed on the address label) when writing to *DD*. This will help us to answer your requests as quickly as possible.

ORS flavouring and colouring: follow-up

DD 32 reported on the possible advantages and disadvantages of using flavoured or coloured ORS compositions. Recent evidence from Pakistan⁽¹⁾ shows the importance of ensuring that using flavoured ORS does not lead to overconsumption, and consequent hypernatremia. A study showed that flavoured and unflavoured ORS were equally acceptable during the initial rehydration period. During the maintenance period, however, when taste rather than thirst is more likely to influence fluid intake, flavoured solution was preferred and hence consumed in greater quantities.

1. Nayyar, G., et al., 1987. *Comparative clinical trial of acceptability of flavoured vs non-flavoured ORS (WHO formula)*. *J.P.M.A.* July: 167-170.

AHRTAG's resource centre

The resource centre at AHRTAG is a focus for the exchange of information on primary health care and appropriate health technologies.

The following resource lists are available:

- **Health education on diarrhoeal diseases** — manuals, bibliographies, health education materials, journals and audiovisuals about diarrhoeal diseases. Also includes a list of international resource centres. *Cost: £0.50 (free to developing countries).*
- **French health education materials and information** — organisations in Africa, Europe and North America which produce French language health education materials. *Cost: £0.50 (free to developing countries).*
- **Spanish health education materials and information** — organisations in Latin America, Europe and North America which produce Spanish language health education materials. *Cost: £0.50 (free to developing countries).*
- **Community assessment and evaluation** — currently available publications and articles, where to get them and prices. *Cost: £0.50 (free to developing countries).*
- **Free international newsletters** — a comprehensive list of 73 free international newsletters on health and development. Each is listed by address, frequency of publication, language and a brief description of the contents. A subject index is also included. *Cost: £0.75 (free to developing countries).*
- **Directory of primary health care courses in the U.K. (under 6 months) and Directory of primary health care courses in the U.K. (6 months — 2 years).** Both directories include a comprehensive list of courses held in the U.K. on primary health care and related topics. Each entry includes where the course is held, dates, duration, number of places for students, fees, entry requirements, and a curriculum outline. The courses are indexed by subject and city. *Cost of each directory: £3.50.*

Resource lists available from Resource Centre, AHRTAG, 1 London Bridge Street, London SE1 9SG, U.K.

Vitamin A and diarrhoea

Reducing the risk?

Vitamin A is an essential nutrient, especially in preventing eye diseases. Can it also help to prevent diarrhoea and other infections? André Briend discusses the latest evidence.

Xerophthalmia is the term used to describe the eye diseases caused by a deficiency of Vitamin A. Symptoms range from difficulties in seeing in poor light to severe damage to the cornea which can result in blindness⁽¹⁾. The main objective of current programmes distributing capsules of vitamin A is to prevent blindness due to xerophthalmia. There is no doubt that these programmes are effective for that purpose, and that malnourished children with diarrhoea who are especially at risk of going blind benefit from them.

Vitamin A affects the health of the eye because of its role in the growth and development of epithelial cells. The gut is also lined with epithelial cells and so

it seems reasonable to suppose that a deficiency of vitamin A might increase susceptibility to diarrhoeal disease. Some studies also suggest that vitamin A deficiency may reduce the effectiveness of the immune system, which would also increase the risk of diarrhoea. The evidence for such an effect is still very limited but deserves careful consideration.

Many factors involved

A link between mild vitamin A deficiency and an increased risk of diarrhoea has been suggested by studies in Indonesia. The first study found that

children with symptoms of xerophthalmia had more attacks of respiratory disease and diarrhoea, and that more children died in this group than in a similar group of children without xerophthalmia⁽²⁾⁽³⁾. Explaining these findings is difficult because many other factors could have been involved that were not studied or known, and so it is not possible to state confidently that vitamin A deficiency caused this effect. For example, stopping breastfeeding at an early age is a factor associated with increased risk of diarrhoea, xerophthalmia and death⁽⁴⁾⁽⁵⁾. Also, a history of repeated attacks of diarrhoea increases the chances of further attacks and of vitamin A deficiency. It has also been suggested that these findings could be explained by differences in nutritional status.

Significant differences?

In an attempt to confirm their initial findings, the same researchers in Indonesia carried out another study. This study examined the effect of providing vitamin A capsules every six months to children in randomly selected villages, and comparing them with children in other (control) villages who did not receive vitamin A supplements⁽⁶⁾. The results show significant differences, but there is some evidence that the experimental and control villages were not exactly alike in some important respects⁽⁷⁾. The authors' claim, that the intervention reduced child mortality by as much as 34 per cent, should therefore be treated with some caution. In addition, the report did not mention what caused the deaths of children, so it was not possible to check that deaths due to diarrhoea were reduced in the group of children who received vitamin A supplements.

No conclusive evidence yet

A more recent study conducted in India⁽⁸⁾ using methods very similar to the first Indonesian study failed to find an association between xerophthalmia and the incidence of diarrhoea (although it did report an increased frequency of respiratory diseases associated with xerophthalmia). The preliminary findings of several current studies at the International Centre for Diarrhoeal Diseases Research,



UNICEF photo by Sue Steiner

Malnourished children with diarrhoea who are especially at risk of going blind benefit from being given vitamin A capsules.

Vitamin A and diarrhoea



WHO photo

Breastfeeding reduces the risk of diarrhoea and other infections.

Bangladesh (ICDDR,B) also do not support the theory that the incidence of diarrhoea can be reduced by the provision of vitamin A supplements.

In summary, there is no conclusive evidence yet that vitamin A supplements can be used to control diarrhoeal diseases. No definite statements can be made at this stage, however, because few studies have investigated this issue. None have looked at the effect of vitamin A status on the duration of diarrhoea or on the occurrence of complications, although the possibility of some effect on these is plausible. More research is needed before any benefits of vitamin A, in addition to its ocular effects, can be confirmed*.

André Briend, MD, Nutritionist, International Centre for Diarrhoeal Diseases Research, Bangladesh, GPO Box 128, Dhaka 2, Bangladesh.

*WHO/CDD is interested in supporting such research.

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2. Sommer, A., et al., 1984. Increased risk of respiratory disease and diarrhoea in children with pre-existing mild vitamin A deficiency. *Am. J. Clin. Nutr.* 40: 1090-1095.
3. Sommer, A., et al., 1983. Increased mortality in children with mild vitamin A deficiency. *Lancet* 2 (Sept. 10): 585-588.
4. Tarwotjo, I., et al., 1982. Dietary practices and xerophthalmia among Indonesian children. *Am. J. Clin. Nutr.* 35: 574-58.
5. Briend, A., et al., (in press). Breast-feeding, nutritional status and survival in rural Bangladesh. *Br. Med. J.*
6. Sommer, A. et al., 1986. Impact of vitamin A supplementation on childhood mortality. *Lancet* 1 (May 24): 1169-1173.
7. Feachem, R.G., 1987. Vitamin A deficiency and diarrhoea: a review of inter-relationships and their implications for the control of xerophthalmia and diarrhoea. *Trop. Dis. Bull.* 84: R1-R1.
8. (No author) 1987. Mild vitamin A deficiency and childhood morbidity — an Indian experience. *Am. J. Clin. Nutr.*, 46: 827-829.

Note

The article listed as reference 7 above (Feachem, 1987) is a recommended source for further information on Vitamin A deficiency and diarrhoea. The evidence for links between vitamin A deficiency and diarrhoea are discussed and areas where further research is needed are highlighted.

Four possible reasons for giving vitamin A to children with diarrhoea are identified:

- to contribute to the control of vitamin A deficiency in the community;
- to prevent future xerophthalmia in children with diarrhoea;
- to help with a current attack of diarrhoea; and
- to reduce the risk of future attacks.

The review includes a warning that it is possible to give dangerously large doses of Vitamin A.

Readers who would like to know more about these studies should write to Dr Briend at the ICDDR,B.

News and information about Vitamin A

The International Vitamin A Consultative Group (IVACG) met in December 1987 in Addis Ababa, Ethiopia to discuss the development and use of integrated operational programmes to combat vitamin A deficiency, particularly in Africa. Further information from: *IVACG Secretariat, The Nutrition Foundation Inc., 1126 Sixteenth Street, N.W., Washington D.C. 20036, U.S.A.*

Assignment Children: a new book published by UNICEF on Vitamin A deficiency and xerophthalmia. Susan Eastman reports on recent research covering all aspects of this subject, from recommended daily allowances of Vitamin A to links with diarrhoea and nutrition. Available from *UNICEF Programme Division, UNICEF House, 3 United Nations Plaza, New York, N.Y. 10017, U.S.A.* Price: US\$3.00

The Xerophthalmia Club Bulletin: an eight page newsletter which reports on current developments in the control and prevention of nutritional eye diseases. Appropriate methods and primary health care are stressed. Available free of charge to those interested in xerophthalmia from *Dr D. S. McLaren, Club Secretary, Department of Medicine, The Royal Infirmary, Edinburgh EH3 9YW, U.K.*

Supercarrot: a new type of carrot with ten times the normal amount of carotene (which the body converts to vitamin A) has been developed by the U.S. Department of Agriculture. Vitamin A deficiency increases the risk of diarrhoeal disease, malnutrition and eye disease, and causes blindness in severe cases. Field tests are being carried out in south Asia and central Africa. Further information is available from the *Agricultural Research Service, Department of Horticulture, 1575 Linden Drive, University of Wisconsin, Madison, WI 53706, U.S.A.*

A nursing perspective

Oral rehydration therapy to treat dehydration from diarrhoea is safer and cheaper than other methods, and is equally valuable in developed and developing countries. Nurses and parents can play a key role. Christine Candy reports from the U.K.

The first step in the treatment of diarrhoea is to recognise that it is the loss of fluids and electrolytes (salts) from the body that is potentially dangerous and that replacement of these losses by oral rehydration allows the patient to recover.

The role of nurses

The use of oral rehydration can lead to greater involvement of nurses and parents in the management of children with diarrhoea. The majority of chil-

dren with diarrhoea attending the Children's Hospital, Birmingham (U.K.) are treated in the Accident and Emergency Department. In most acute cases, initial assessment by the medical staff is followed by management by nursing staff. An important change in policy is that nurses only refer the patient for further assessment if they are in doubt about the child's progress after being given preliminary ORT. Now, in addition to their previous responsibilities, trained nursing staff take the case history, prescribe fluid requirements, and teach parents to rehydrate their child by mouth.

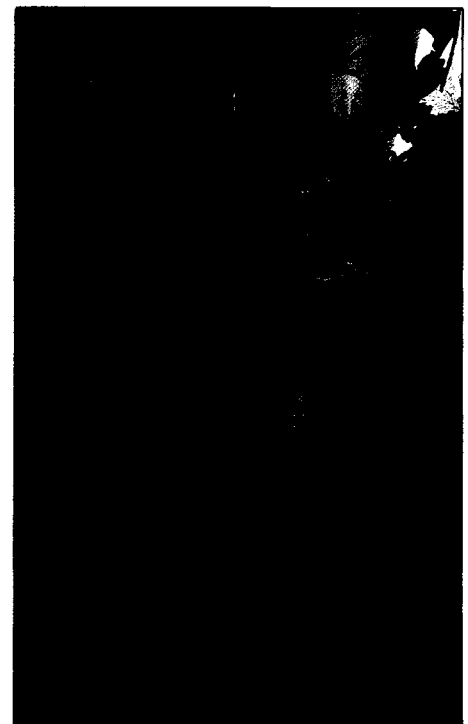
Follow-up

The next day parents attend a follow-up clinic with their child, and the nurse assesses the success of the treatment. This assessment is based on:

- weight change;
- frequency of vomiting and diarrhoea;
- whether the child is drinking eagerly; and
- the volume of solution that has been drunk. If the child is recovering, the nurse encourages continuing feeding with drinks and a normal diet and makes sure that parents understand what they need to do. Nursing staff then follow the child's progress, and discharge him/her when the diarrhoea has stopped and weight is being gained.

Advantages of ORT

ORT is simple, safe, and cheap. Any nurse who has had to start an intravenous drip in a frightened child will soon



Using oral rehydration parents can be actively involved in treatment.

realise that ORT is a much more pleasant alternative. It is surely preferable to sit cuddling a child while encouraging him or her to take small sips of fluid.

Oral rehydration is also less alarming to parents. They can be actively involved in giving the treatment. The child is more mobile when not attached to a drip, and there is no anxiety that the tube may be displaced. The child does not have a dry mouth and can be encouraged to eat normally. Although this method of rehydration is more labour-intensive, the time taken for rehydration and recovery is less. If nursing staff shortage is a problem, and parents are not available, then a nasogastric tube can be passed. Giving fluid in this way may be preferable to the pain of intravenous infusions (see *DD 26*). Using ORT, paediatric nurses, in partnership with parents, can treat greater numbers of children suffering from this life-threatening condition. Using ORT also means less discomfort and weight loss for children, less parental anxiety, decreased length of hospital stay, and financial savings.

Christine Candy, Paediatric Nurse Tutor, Queen Elizabeth School of Nursing, Medical Centre, Edgbaston, Birmingham B15 2TH, U.K.



A nurse gives ORS at the Birmingham Children's Hospital.

Drugs for diarrhoea?

I would like to present a problem facing us in treating cases of diarrhoea. Sometimes the parents and relatives of patients are too worried and agitated to wait for a period of several days for diarrhoea to stop, when oral rehydration therapy alone is used. To them, diarrhoea and not dehydration is the major problem. Because of this, doctors may find themselves obliged to prescribe anti-diarrhoeal drugs and sometimes antibiotics, or the patient will seek another doctor's advice or buy the drugs directly from a pharmacist.

If you can throw any light on the role, if any, of anti-diarrhoeals and antibiotics in the treatment of diarrhoea, and how to determine a bacterial aetiology for diarrhoea in the absence of laboratory facilities, I will be thankful.

Dr Sharif Salry Nassif, 10 Gamal El Dien Street, Tanta, Egypt.

Editors' note: Anti-diarrhoeal drugs are mostly inappropriate, ineffective and sometimes dangerous for young children. The role of drugs, including antimicrobial, antimotility, antisecretory and other drugs, in the treatment of diarrhoeal diseases was covered in *DD* issue 25. A forthcoming issue of *DD* will suggest how to determine bacterial aetiology for diarrhoea in the absence of laboratory facilities.

Drinking water storage

I have read your practical advice item on water purification in *DD* 30. I congratulate you on publishing this useful information which is not given in most community medicine textbooks.

In Karachi, water is purified by rapid sand filters, then chlorinated and tested in laboratories on site before distribution to the various parts of the city. In different multistorey buildings, water is pumped from underground storage tanks to roof tanks from where it is piped to individual flats. In old Karachi, the water tanks are very old and contaminated and need frequent cleaning. Some tanks are made of cement and some are metal. Will you please mention some practical methods for cleaning these tanks and for purifying the water inside them.

Dr Zubair Ahmad, A-1/I, Maymarr Terrace, Block-2, Gulshan-e-Iqbal, Karachi, Pakistan.

Editors' note: See future issues.

Welcome DD in Bengali

Allow me to congratulate you on the decision you have taken to bring out *DD* in my mother tongue, Bengali. Bengali is very widely spoken (by 160 million people). It is the language of Bangladesh, and of the West Bengal and Tripura Indian provinces, and is also spoken by many people in the Bihar, Orissa and Assam provinces of India, as well as by many from Bangladesh in the U.K. and the Middle East. It goes without saying that the success of any journal like *DD* depends on the understanding of it by the readers so that they can make changes to their daily lives. Viva *DD* Bengali — 'Udaramoy Shanglap'.

Dr A.H. Hafizzuddin Ahmed, P.O. Box 32441, Augla (Via Agedabia), Libya.

Giving oral polio vaccine

Your Immunisation supplement in *DD* issue 30 was quite informative. However, I should like some clarification: you had a photograph showing a health worker giving OPV to a child in Colombia, and she was using a teaspoon. I would like to know if there are any vaccine preparations that can or should be given by teaspoon, and whether this method would be more effective than dropping the OPV straight into the child's mouth. If the vaccine is spoon-fed there is a chance that it will not all be licked up by the child, and besides, it adds more time and logistics to provide a spoon. Or perhaps giving vaccine by spoon is more culturally appropriate?

At ICM we provide medical services for refugees and we follow US CDC standards, so necessarily immunisation schedules and preparations are different from the EPI. Thank you very much and more power to your organisation.

Dr Vic S. Salas, Medical Co-ordinator, Intergovernmental Committee for Migration, Mission in the Philippines, 2nd floor, Victoria Building, 429 United Nations Avenue, Ermita, Manila, Philippines.

Dr N. Hirschhorn of Resources for Child Health (REACH) replies: WHO recommends that vaccinators use the dropper supplied with the vial of oral polio vaccine (OPV). This is the most

direct and effective way to deliver the correct drop size. Tilt the child's head back and gently squeeze the cheeks or pinch the nose to make the mouth open. Let the drop fall from the dropper onto the child's tongue. Repeat the process if the child spits out the vaccine. Because the vaccine can be bitter, some OPV manufacturers suggest, especially for older children, that the drops be put in a cup of distilled water or onto a sugar cube, or on a disposable plastic spoon with syrup. These methods are, however, not always possible. Where the photo is really misleading is in showing an older child receiving OPV. We must stress the necessity to immunise children against polio before their first birthday.

Preventing neonatal tetanus

Regarding the Health Basics Immunisation Insert (in Issue 30), this information package has been really well thought out and put together in a very readable form to help people to use the information in a practical way.

However, it is not quite true to say that "hygienic cord treatment can also prevent neonatal tetanus but is not as effective as complete immunisation of the mother". Hygienic cord treatment prevents neonatal tetanus 100 per cent. The problem is to ensure that all contact with the cord is, indeed, clean. Clean cord care usually goes hand in hand with clean delivery care, and therefore the advantages of hygienic practices include not only the elimination or reduction of neonatal tetanus, but also of post-partum and cord infections.

The TBAs who work with the Refugee Health Unit (RHU) in Somalia are trained to use hygienic delivery and cord care practices with extremely good results. RHU can count on two hands the number of cases of neonatal tetanus in the last two years in a population of 800,000 and with 25,695 births (8 neonatal tetanus cases). The effectiveness of hygienic cord care is in no doubt. The problem, as with immunisation, is in ensuring 100 per cent use of the chosen method.

Una MacAskill, Refugee Health Unit, Box 2925, Mogadishu, Somalia.

Dr Hirschhorn: Ms MacAskill is correct, hygienic cord treatment is 100 per cent effective if it can be ensured.

Teaching with DD

The Medical Centre of the Federal Polytechnic, Bida, is a clinic which caters for students and staff of the polytechnic, and their immediate families (about 3,500 people in total). With the introduction of the primary health care programme in Nigeria, we now have an EPI/ORT unit in the clinic which is free to other members of the community. We also have outreach programmes to surrounding villages to give vaccinations and nutritional advice.

It was initially difficult to get members of the Health Team to stop giving antidiarrhoeal drugs and use ORS instead, until we started holding clinical sessions to go through copies of *DD* and discuss issues raised. It has now been fully accepted that drugs are not necessary and a lot of village mothers are now being taught to prepare their own ORS.

Dr C. Gana, Medical Centre, The Federal Polytechnic, P.M.B. 55, Bida, Niger State, Nigeria.

Public latrines

Regarding the letter from Ms Carrie Osborne (*DD* 31) — our small township of Tatkon (population 180,000) has launched a campaign to build fly-proof latrines; one third of the township has now been covered within a year. The market place is the centre of activity in the town, but, until recently, had no proper sanitary facilities. The old latrines were filthy and smelt unpleasant. After discussion with local municipal officials our Township Health Team removed all the insanitary pit latrines and installed pour-flush fly-proof latrines instead. Attendants hired by the authorities refill the water pots (there is no running water in the town) and do the cleaning. Customers are charged a small fee which goes towards the maintenance of the latrines and the salaries of the attendants.

Everybody is happy and our market place is free from obnoxious smells and filthy sights, creating a positive health effect on the surrounding area. Villagers who have used the new latrines are now keen to install fly-proof latrines in their villages as well. So we are practically selling health in our market place!

Myint Oo, Health Assistant, Myauk-myaik RHC, Tatkon Township, Burma.

Living with disease — urban slums

Greetings from Lagos city! The population density here is 5,000 to 7,000 persons per square kilometre. During the wet season, when it rains all day and all night, everything overflows — drains, pits, wells, latrines. The result is an increase in cholera, typhoid, other diarrhoeal diseases and acute respiratory infections. This puts an unbearable burden on an already inadequate health service. I have started a programme of self-reliance health schemes at ten community centres in Lagos, but positive development is difficult without the co-operation of landlords to improve water, sanitation and drainage facilities. The issues covered in *DD* relating to urban conditions are most useful — especially the material on diarrhoea in urban slums (in issue 31).

Sister Brigid Kennedy, SRM, DYM, Medical Missionaries of Mary, PMB 21294, Ikeja, Nigeria.

Water purification

I read with interest your article on "water purification" in *DD* issue 30. I would like to question your advice to keep water boiling for ten minutes in order to destroy germs. Recently, I was informed by WHO/CDD that it would be enough to bring water to the boil! It is very confusing for people to receive different information from different sources. Can you help?

In your article you also asked for other methods of water purification. I worked in Botswana from 1983 to 1985 as the co-ordinator of a National Water Hygiene Campaign. The Department of Water Affairs started a study of storage of water in the sun. We used 15 litre black plastic containers, kept them in the sun for a day and achieved a reduction of bacteria of around 95 per cent (and we used very contaminated water for some of the samples). Unfortunately, we could not finalise the study and find out exactly how many hours of sun was needed or if the method was applicable also during the winter. But the preliminary results were interesting and I would like to know if other people have carried out similar research.

In the campaign we used clean water from standpipes to show people how to keep water clean at home. We found that the most effective method was to use 15 litre plastic containers with a small opening and a lid both for fetching water and for storage (especially drinking water). This way people could not put dirty hands and dippers into the water and it stayed uncontaminated.

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Editors' note: Bringing water to the boil will kill most microbial pathogens. Longer boiling is safer, but more expensive and time consuming.

In the next issue . . .

Diarrhoeal disease control activities have achieved a great deal in many places but there are still problems to resolve. *DD* 34 will include an overview of the CDD programmes of agencies such as WHO, UNICEF and USAID, and individual country reports. Comments from readers about their own CDD activities would be welcome.

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