

Dialogue on Diarrhoea



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Care with food cuts diarrhoea risk

Without food and water, people cannot survive, but these basic essentials for life can easily spread dangerous disease causing organisms. Customs and taboos about how to handle water and food are found in most societies. Many traditional controls make a great deal of sense in the light of the scientific discoveries on which modern public health practices are based. But, unless there is genuine understanding about how a disease like diarrhoea is caused and carried, risky contamination of both food and water is likely to con-

tinue. People are not born with hygiene know-how: it has to be learnt.

A worldwide problem

This issue of *DD* looks at food related diarrhoea as a significant health risk in the so-called developed countries as well as in the Third World, particularly among poor urban communities and the most vulnerable age groups — the young and the old. The incidence of this type of diarrhoeal disease is noticeably on the increase, for example in the UK (see page 3). Problems of food hygiene vary between countries at different levels of industrialisation. There are, however, many practical ways to

prevent food borne infections which can be appropriately adapted to local cultures and resources. *Dialogue* readers may like to add their own suggestions to those described in the following pages.

Always remember ORT

In all episodes of acute diarrhoea in all countries, whatever the source of infection, dehydration is the immediate danger, and oral rehydration therapy is the most effective response. The value of ORT obviously still needs to receive much greater stress in the education of all health professionals worldwide, as well as being conveyed to the general public. **KME and WAMC**



Photo by E. Schwab/WHO

Hygienic food preparation helps to prevent food related diarrhoeal diseases.

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- Practical advice on preventing food borne infections
- Health extra: Practical hygiene

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Food borne illness

World overview

Good food is essential for good health, and is one of the greatest pleasures in life. Despite advances in technology, providing food that is safe to eat and keeping it safe is still a worldwide public health problem. Illness, especially diarrhoea, caused by contaminated food is a major cause of suffering and death, and also contributes to malnutrition in the developing world.

Precise figures for food borne illness are not available in many countries, but WHO estimates that only a tiny proportion is currently recognised, and an even smaller fraction reported. In developing countries, the ratio of actual to reported cases may be as high as a hundred to one, while in industrialised countries, food related health problems reported may be less than ten per cent of the actual total. It is not surprising, therefore, that the impact on health of food borne disease has been a neglected subject.⁽¹⁾

It has been estimated that, in 1980, more than a thousand million cases of acute diarrhoea occurred in developing countries (excluding China) in children under the age of five and that five million of those children died.⁽²⁾ While there are several ways in which diarrhoea causing agents can be transmitted, contaminated water was until

recently thought to be the most common. However, scientists now recognise that contaminated food is also an important source of the germs that cause diarrhoea.^(1,3)

A universal concern

The more industrialised countries also have serious food safety problems. Food safety legislation needs to be improved, as does public health education about hygiene and safe food storage and preparation. For example, recent estimates of the extent of food borne disease in the USA range from 6.5 million acute episodes, with 9,100 deaths every year,⁽⁴⁾ to much higher estimates of 24 to 80 million acute food borne disease episodes a year.⁽⁵⁾

In industrialised countries, a few factors are responsible for most cases of food borne disease: preparation of food too far in advance of eating; prepared food left for too long at a temperature which allows bacteria to multiply; inadequate reheating; and an infected person handling food.⁽¹⁾ In developing countries, these factors are significant, but there are also others which need to be identified and taken into account in order to plan preventive action.

Few countries have integrated food safety into their primary health care systems. Reducing the rate of food borne illness requires understanding of hygienic food handling at all levels: in factories, shops, markets and at home.⁽⁶⁾

The World Health Organization regards illness due to contaminated food as one of the most widespread health problems in the contemporary world. In infants and the elderly, the consequences can be fatal. Protect your family by following these simple rules. They will reduce the risk of food borne disease significantly.

The WHO Golden Rules for safe food preparation

1. Choose foods processed for safety
2. Cook food thoroughly
3. Eat cooked foods immediately
4. Store cooked foods carefully
5. Reheat cooked foods thoroughly
6. Avoid contact between raw and cooked foods
7. Wash hands before preparing food and after using the toilet
8. Keep all kitchen surfaces clean
9. Protect foods from rodents, insects and other animals
10. Use clean, uncontaminated water to prepare and cook foods

A poster listing these Rules for Safe Food Preparation in more detail is available from Dr Kaferstein at the address below.

Dr F K Kaferstein, Manager, Food Safety Unit, World Health Organization, 1211 Geneva 27, Switzerland.

1. *The role of food safety in health and development, 1984. WHO Report of a joint FAO/WHO Expert Committee on Food Safety: WHO/TRS 705.*

2. *Snyder, J D and Merson, M H, 1982. The magnitude of the global problem of acute diarrhoeal diseases. Bull. WHO 80: 605.*

3. *Barua, D and Kaferstein, F K, 1983. The role of food in the epidemiology of acute enteric infections and intoxications. Report of WHO meeting. WHO offset document EFP/FOS/83.48.*

4. *Cohen, M L, 1987. Prepared statement, in Hearing before the Committee of Agriculture, Nutrition and Forestry, US Senate, 100th Congress, First Session, June 4 1987 page 28. US Government Printing Office, Washington D. C.*

5. *Archer, D L and Kvenberg, J E, 1985. Incidence and cost of foodborne diarrhoeal disease in the United States. J. Food Protect. 48: 887.*

6. *Kaferstein, F K, 1988. The Pleasures and Pitfalls of Eating. World Health, November.*



Always wash your hands before preparing food.

Photo by UNICEF

Case study: Leeds, UK

Hygiene, food safety and diarrhoea

In many industrialised countries food borne diarrhoeal disease is actually increasing. ORT is the most appropriate treatment anywhere in the world for dehydration caused by diarrhoea, and education about food hygiene is relevant everywhere.

Leeds is an industrial city in the north of England with a population of about 700,000. Cases of diarrhoea are not formally recorded, but cases of dysentery and food poisoning are notified by doctors to the City Council. In 1988, 373 cases of dysentery were notified in the city and 1,800 cases of food poisoning

and supermarkets. Processed foods look attractive and can be cooked quickly — a real help for busy people. Food manufacturers like to produce these 'ready to eat' meals because there is a large profit on them. Unfortunately they do not have a long shelf life, and keeping them in a refrigerator for sev-



Photo by Steve Benbow/Network

Wherever you buy your food, safe food preparation is important.

came to the attention of the Environmental Health Department. Most of the dysentery is due to *Shigella sonnei* which mainly attacks groups of young children in the poorer parts of the city. Food poisoning (in all age groups) has been increasing both in numbers affected and in severity in recent years. The greatest single problem has been found to be salmonella infection, principally associated with eggs and poultry.

It is interesting to consider possible causes of this increase. There are more processed foods now available in shops

and supermarkets. Processed foods look attractive and can be cooked quickly — a real help for busy people. Food manufacturers like to produce these 'ready to eat' meals because there is a large profit on them. Unfortunately they do not have a long shelf life, and keeping them in a refrigerator for sev-

eral days may not prevent contamination. (One cold-loving food poisoning organism, *Listeria monocytogenes*, grows at cold temperatures). A quarter of homes in England now have a microwave oven, which heats up food very rapidly, but does not always kill food poisoning organisms. Self defrosting refrigerators are now common, and are not cleaned out as frequently as older models which have to be defrosted regularly. This allows unhygienic conditions to develop. 'Progress' in the kitchen is not without its pitfalls!

Outbreaks and management

The management of diarrhoea is carried out by general practitioners and can be very varied. Many patients are still told not to eat any solid food until their condition improves. Far too few UK doctors give positive advice about diet, and a few still recommend the exclusion of all milk (breast and bottle) from the diet of a child with diarrhoea. Unfortunately the teaching of medical students hardly touches this important subject. Most of what is taught is about the disturbance of electrolyte levels and the need to correct these 'laboratory findings'. Looking at the patient as a person, and encouraging the use of oral rehydration therapy still need to be emphasised.

When notifications are received, they are usually investigated and followed up with control measures where appropriate. One of the biggest problems is getting people to remember what food they have eaten before the onset of the illness. Specially trained infectious disease nurses seek to obtain histories to find out where the patient picked up the infection, whether or not other people are ill, and whether others are also at risk from the primary source or from the infected person. Food handlers and people working with the very young, the very old, or patients with damaged defence mechanisms are asked to stop work until they have recovered, and are helped if need be by compensation from the City Council.

Shigella infections are rarely food borne in the UK. In nurseries and schools, infection is most likely to occur where toilets are poorly maintained (with no towels, soap or hot water, for example), and where children do not wash their hands after defaecation. Inspections of nurseries and schools in this city show that maintaining good hygiene in toilet areas is often a low priority. The main tools available to deal with outbreaks are good history taking, screening by stool examination and close attention to personal and environmental hygiene arrangements.

Dr Martin Schweiger, Specialist in Community Medicine, Leeds Eastern Health Authority, Meanwood Park Hospital, Tongue Lane, Leeds LS6 4QD, UK.

Preventing food borne infections

In many communities, there may be no one to teach and promote basic health education relating to hygiene, and protection of food from contamination. Recent WHO policies and, in particular, the publication of 'The Community Health Worker',⁽¹⁾ promote self-help in food hygiene as well as in other areas. This book contains information which primary health care workers need to help village communities raise hygiene standards.

Food safety

Food should be kept clean at every stage — from production until it is eaten. Stale or contaminated food can cause diarrhoea and other diseases. Clean water is needed for washing foods before eating and for cooking.

• Vegetables

Vegetables may have been fertilised with human or animal faeces and therefore they should always be well washed and properly cooked before they are eaten. Vegetables to be eaten raw must be well washed in clean water.

• Meat

Eating raw or undercooked meat (including poultry) can be dangerous. Eating infected or contaminated meat can cause severe vomiting and diarrhoea, infestation with worms and other serious illnesses. At home, surfaces on which meat is cut and knives used for cutting it should be very well washed and dried with a clean cloth before and after use. To prevent spoilage, meat may be dried, salted or cooked immediately. Cooked meat should be eaten at once or within a very short time of cooking.

• Fish

Fish can go bad very quickly in warm climates, sometimes within a few hours of being caught. Shellfish can spread disease, especially if caught in water contaminated with sewage, or if eaten raw or undercooked.

Fresh fish should always be gutted as soon as possible, kept out of hot sunlight and as cold as possible, and cooked and eaten without delay.

• Milk

To avoid diseases spread by milk, it may be wise to boil it before drinking and to store it in a clean container (for example, one in which water has been boiled or which has been rinsed out with hot water). If milk has to be stored for use during the day, reboil it if possible every four or five hours if there is no means of keeping it cool. Pasteurised milk is usually safer than raw milk.

• Eggs

All eggs should always be thoroughly cooked.

• Fruit

Fruit should be eaten as soon as possible after being washed or peeled.

Basic food hygiene rules

Following these basic rules will protect food from contamination.

1. Wash your hands (with soap, if possible) before food preparation, eating, and after using the toilet.
2. Any person who is ill, particularly if suffering from diarrhoea, should not handle or prepare food.
3. Wash your hands again if you handle clothes or waste material, or attend to children (for example, changing nappies) while food is being prepared.
4. Raw foods should be stored and handled separately from cooked food, to prevent cross-contamination.
5. All surfaces, cooking dishes and other utensils should be cleaned thoroughly after the preparation of raw foods.
6. Do not prepare food too far in advance of when it is to be eaten (if food must be prepared in advance at all). Food for infants should preferably be freshly cooked or prepared for each meal.
7. Food should be cooked thoroughly, not part-cooked or undercooked and, wherever possible, should be served immediately while still hot. Cooking food to a high temperature kills disease causing organisms.
8. Store cooked foods carefully. If food is prepared in advance, it must be kept either hot (above 60°C) or cool (below 10°C). Leaving cooked food to stand in warm conditions allows germs to multiply; the longer food is left, the greater the increase of germs. If food is kept, it should be reheated thoroughly to a high temperature (boiling or bubbling) to kill germs.
9. Food to be eaten cold should be covered during cooling and storage especially if it is perishable, like meat or fish. It should be kept as cool as possible.
10. Food should be protected from contamination at all times. Keep cats, dogs, other animals, waste water and rubbish containers away from food. Do not allow rubbish to accumulate where preparation and cooking of food takes place. Protect stored food from rodents and insects.
11. Use clean, uncontaminated water for washing and cooking food or making ice for drinks (or boil it first to kill any dangerous germs).

Mr M Jacob, Environmental Health Officer, Department of Health and Social Security, Alexander Fleming House, London SE1 6BY, UK.

1. WHO, 1987. *The Community Health Worker*. WHO: Geneva. (ISBN 924 156097 (Swfr 22)).

2. Roberts, Diane, 1987. *Common sense in the kitchen*. World Health, March.

Breaking the chain of infection

Interrupting the transmission of food borne pathogens can reduce diarrhoeal disease rates. Robert Black and Dirk Schroeder show how weaning foods can become contaminated, and suggest appropriate interventions to prevent this from happening.

Weaning food contamination is an important cause of high rates of diarrhoea in infants. This is particularly true under less hygienic conditions where disease causing organisms (pathogens) commonly contaminate supplementary foods and liquids. Delaying exposure of a baby to contaminated foods is one of the many good reasons for encouraging exclusive breastfeeding for the first four to six months of life. After this age, however, the rapidly growing infant requires more nutrients than breastmilk alone can provide. Therefore, understanding how weaning foods become contaminated, and how to reduce or eliminate pathogen transmission, is of the utmost importance.

Weaning foods may become contaminated at several stages:

- before food reaches the household;
- during preparation;
- during storage; and
- during feeding.

Before food reaches the household

In societies which use human or animal faeces as agricultural fertilisers, lack proper waste disposal and sanitation systems or have inadequate standards of hygiene in food handling, raw foods are often contaminated. Some foods have characteristics which increase the risk of contamination, for example, whether they grow in or near the ground, or have a high moisture content and moderate pH. Vegetables or fruits which are not peeled, unrefrigerated animal (including dairy) products, and mixtures made using impure water are particularly dangerous.

Unfortunately, contamination at this level is often determined by agricul-

tural production and transport methods outside the control of the individual family. Consequently, strategies to reduce food contamination are necessary at the household level.

Preparation

Assume that food may be contaminated and must be properly prepared for safe consumption. Peeling and washing raw foods may decrease numbers of micro-organisms, but it is difficult to make raw foods completely safe just by washing them. This is particularly true in areas where water is scarce or is itself contaminated. Cooking is preferable. Boiling, frying or baking for example, at high temperatures and for a sufficient period of time, are good ways to kill pathogens. Unfortunately, due to shortage of fuel and time, foods are not always cooked for long enough at high enough temperatures.

An alternative approach, to prevent bacteria multiplying, is the souring (lowering the pH) of food mixtures. Many traditional weaning foods (particularly in Africa) are prepared by fermentation with lactobacilli. Nutritionists designing improved weaning foods could consider souring as an approach to reducing risk of food contamination.

Even if a food is free of pathogens when preparation begins, contamination may occur if the food is handled with unwashed hands or comes in contact with dirty utensils or kitchen implements. Poor personal hygiene, especially inadequate handwashing, appears to be a particularly important factor in secondary contamination. Field investigations have measured substantial reductions in diarrhoeal rates with adoption of improved handwashing techniques, although it is still unclear

which components of handwashing (e.g. quantity of water and/or soap) most effectively limit transmission.

Storage

In poorer households, food is usually stored without refrigeration. Hot and humid environments provide ideal conditions for bacterial growth. Typically, a busy mother will prepare a weaning mixture at one point in the day and store the remainder to be eaten later. If a food mixture has been contaminated during preparation, it is likely that pathogens will multiply during storage, resulting in higher risk at subsequent feedings. Storage at cold or very hot temperatures will prevent bacterial multiplication. If this is not possible, fresh preparation before each serving, or thorough reheating, is necessary.

Feeding

The utensils used to feed a weanling infant can influence transmission of pathogens. Feeding bottles and bottle nipples have been shown consistently to be contaminated, probably because they are difficult to clean. Studies suggest that adequate disinfection of bottles is nearly impossible in most developing country situations. Thus, actively discouraging the use of feeding bottles is appropriate; in Papua New Guinea, virtual elimination of feeding bottles (by legislation) has led to lower diarrhoea rates. Although bowls and spoons used for feeding may also be contaminated, the levels of contamination are significantly less than those of bottles. Bowls and spoons are also much easier to clean. Dirty hands can transmit germs directly to the infant during feeding, so proper handwashing is always necessary before feeding.

Many of the strategies to reduce contamination of weaning foods are technically quite simple; it is lack of knowledge and limited resources at the local level which prevent improvements. Appropriate interventions which are sensitive to local culture and conditions, and which include health education, can reduce infant diarrhoea worldwide.

Professor Robert Black and Dirk Schroeder, Department of International Health, The Johns Hopkins School of Hygiene and Public Health, Baltimore, Maryland 21205, USA.

Improving environmental hygiene

How to plan a community based project

Eileen O'Rourke and Mahamadou Kaya give guidelines for the community based, self-financing disposal of refuse, one way to improve environmental hygiene while encouraging community development.

Failure to involve the community intended to benefit in any environmental hygiene project will almost certainly result in the project's failure.⁽¹⁾ If participation begins at the planning stage, members of the community have the opportunity to discuss what they believe to be their environmental hygiene problems. If they do not think they have a problem, then it is unreasonable to expect the community

to participate. In such cases, it is best to begin with health education, and then to reassess changes in attitude. Where community needs can be clearly identified, the next step is to ensure that any technology introduced is culturally acceptable, affordable and can be successfully used to meet those needs.

Our experience of community based environmental hygiene projects was in a Sahelian town, of approximately

80,000 people, in West Africa. Due to lack of money there is little government support for hygiene projects. Our projects therefore had to be self-generating and self-financing.

Refuse collection

After a series of meetings with local officials and community leaders, we started to build stabilised mud and cement brick refuse dumps all over the town. The dumps were emptied every day by a team using donkeys and carts. The refuse was mainly organic waste and household sweepings, which proved to be a useful and saleable product for filling in holes to prepare land for housebuilding, and for composting. We used the common 'Chinese high temperature' composting system⁽²⁾ (but with organic waste from the town abattoir instead of human excreta, the handling of which is unacceptable in Muslim societies). The compost was used as fertilizer.

All labour and materials used in the project, except the cement, were locally available. A group of displaced people learnt to make bricks and construct the refuse dumps, and so acquired useful construction skills. The donkeys and carts are a more appropriate form of transport for the narrow, crowded streets of the town, than an expensive refuse lorry. The refuse workers were paid by having the use of the donkeys and carts after work, and with a small salary from the sale of the refuse.

This simple system proved to be an effective and appropriate technology. The community could understand and benefit from the improved town hygiene, local employment and refuse by-products.

Eileen O'Rourke, 1 York Road, Rathmines, Dublin 6, Eire, and Mahamadou Kaya, Regional Director of Hygiene and Sanitation, Mopti, Republic of Mali.

1. World Bank, 1980. *Appropriate Technology for Water Supply and Sanitation: a Planners' Guide. Volume 2.*

2. Winblad, Uno, et al., 1978. *Sanitation Without Water. Sundt Offset: Stockholm. (Pages 30-32 include more detailed information on the composting technique mentioned above).*

General guidelines for community development

- Survey existing hygiene practices and try to include what people perceive to be their needs in any new programme.
- Respect the views and wishes of the community which must have confidence in your ability and sincerity. Time must be allowed for this relationship to develop.
- Use appropriate technology, with emphasis on local materials and labour as this facilitates self-reliance and sustainability.
- The community should contribute directly to the project, either financially or by supplying labour or materials. The degree of community participation will depend on household incomes and perceived needs.
- Community participation is different in rural and urban environments, but personal contact, dialogue and timing are important in both.
- Incorporate education programmes within a working project and present the community with feasible solutions or alternatives.
- Wherever possible, use educators who are accepted members of the community and who are aware of local customs and speak the local languages.
- Give special emphasis to women in community education projects, because women are responsible for childcare and hygiene in the home. It is more difficult, but often more important, to change attitudes than to introduce a new technology.
- When planning a project, it is usually better to take a long term view and an integrated environmental health approach, rather than concentrating on one factor in isolation.
- It is important to have the support and permission of the local institutions and administration. Work with them, if possible, as they may eventually be responsible for the maintenance and continuation of the project and for the development of related projects in the community, for example community latrines or washing facilities.

Environmental health in the Caribbean

The Environmental Health Officer is required to perform a wide range of functions, all of which have a bearing on community health, and on diarrhoeal diseases in particular.

The role of the Public Health Inspector, or EHO, is largely a preventive one, because s/he is concerned with the environment. The environment and conditions in which people live affect health status and the types of illness suffered by the community.

Public education

An important function is that of educator: the EHO needs not only scientific knowledge, but also to be able to tell people about health hazards both immediate and potential, and generally to stimulate and develop community health consciousness.

The EHO has a responsibility for

checking the fitness of buildings, both for living and working in. The adequacy of floor and air space and ventilation, quality and quantity of water supplies (for personal, domestic and industrial purposes), proper lighting, protection against dampness in buildings, and the proper provision of drainage and sanitation (especially in relation to places where people live) must all be considered. Another important activity is the checking of foodstuffs intended for sale in shops and markets. The EHO also provides statistical data used to plan and organise future health programmes, as well as for keeping the appropriate authorities aware of current conditions.



Photo by WHO

The Environmental Health Officer informs people about immediate as well as potential health hazards and how to avoid them.

As a result of effective public health programmes over the years, the health status of people in the Caribbean has improved considerably. But this success is threatened by lack of financial resources and shortages of staff, drugs and other supplies. The migration of trained health workers out of the Caribbean is also a major problem.

In response to these problems, Caribbean governments have agreed on a new approach: the 'Caribbean Co-operation in Health' initiative which is being carried out in conjunction with the Pan American Health Organization (PAHO) and the Caribbean Community (CARI-COM). The following six areas have been identified as health priorities:

- environment protection and vector control;
- human resource development;
- chronic non-communicable diseases and accidents;
- strengthening health systems;
- food and nutrition; and
- maternal and child health and population control.

Projects will be developed in these areas, with emphasis on more productive use of resources.

The Caribbean Association of Environmental Health Officers (CAEHO) is a regional, non-profit, voluntary association. Formed in 1970, it represents national member associations in Antigua and Barbuda, Barbados, Dominica, Grenada, Guyana, Jamaica, St Lucia, St Vincent and the Grenadines, and Trinidad and Tobago. The Canadian Public Health Association (CPHA) has been assisting CAEHO since 1986, when a collaborative project was started. This project aims to strengthen member associations and enhance the professional status of the Environmental Health Officer (EHO).

Key activities include improving communication between member associations and training.

The project assists in organised in-service continuing education programmes and supports the establishment of a post-basic degree programme in the Caribbean for senior level EHOs.

Mr HI Bell, Chief Public Health Inspector of Barbados (retired), c/o Dr L Harvey, CAEHO, 2nd floor, NUPW Building, Dalkeith Road, St Michael, Barbados.

ICORT III conference report: ensuring sustainability

The Third International Conference on Oral Rehydration Therapy (ICORT III) was held in Washington D.C. in December 1988. Over three hundred invited experts on all aspects of health and policy relating to the prevention of diarrhoeal diseases attended.

Previous ICORTs, held in 1983 and 1985, focused on promoting the use of oral rehydration solution and developing more widespread use of ORT. The theme of the Third Conference was 'ensuring sustainability' of ORT and CDD activities into the 1990s. In his opening address, Mr Alan Woods of the US Agency for International Development (AID sponsored the meeting in co-operation with UNICEF, UNDP, the World Bank and WHO) emphasised AID's commitment to long term sustainability. This requires:

- ensuring that all families have access to appropriate information about the use of ORT;
- increasing ORS production and distribution capacity within developing countries; and
- developing financially independent national CDD programmes.

Broad approach to CDD

Other speakers included James Grant, Executive Director of UNICEF, Hiroshi Nakajima, Director-General of WHO, and representatives from national CDD programmes. Many speakers referred to the need for a broad approach to the control of diarrhoeal diseases, and to move away from a single intervention focus. ORT remains crucial, but is most effectively implemented in conjunction with other CDD activities.

Alfredo Bengzon, Secretary of Health for the Philippines, reminded the Conference of the vital role of social

change in improving health standards. Outlining national progress and problems, Dr Bengzon stressed the importance of training and motivating health workers in particular, but also whole communities. In Dr Bengzon's view, sustainability in ORT, and any other force for social improvement, depends on a sustained effort against poverty and ignorance, corruption and exploitation.

New developments

Giving a global overview on behalf of the World Health Organization, CDD Programme Director Michael Merson pointed out the significance of universal endorsement for a single solution — ORS — to treat dehydration resulting from any diarrhoeal disease, whatever the cause, in people of all ages and nutritional status. Dr Merson also acknowledged the usefulness of fluids available in the home for the early treatment of dehydration. The lack of uniform measuring utensils and of adequate, consistent training means that mothers often do not prepare sugar-salt solutions accurately. WHO now considers that cereal-based fluids may be more appropriate for the prevention and early treatment of diarrhoea, although they are not a substitute for adequate feeding during and after diarrhoea.

Integration

Key issues brought out during the Conference included the need to:

- plan CDD programmes as part of long term health development projects;
- develop permanent infrastructure, (including reliable, effective communications channels, training, monitoring and evaluation services) rather than short term campaigns for the delivery of health care;
- reach the most isolated and needy communities, especially the urban poor and those without access to the formal health sector;
- accept and stimulate community participation in ORT;
- promote good hygiene and nutrition, especially breastfeeding and

good weaning practices, to prevent diarrhoea and reduce the severity of its effects; and

- educate mothers and children as the best way to ensure changes in the behaviour of future generations.

All these issues are connected by the theme of integration. Many speakers at ICORT III concluded that ORT and other CDD activities are more likely to be successful and sustained if they are integrated with other development projects and not attempted in isolation. As Dr Bengzon put it, "Diarrhoea is a worldwide problem, but the world has more problems than just diarrhoea", and ORT can usefully be seen as just part of a larger scheme to address these problems.

Child-to-child

The Child-to-child Programme was started in 1979, the International Year of the Child, to promote communication and development by schoolchildren to other children, their parents and communities. The Programme has proved to be a successful way of integrating primary health care into primary school education. Those who would like to receive information on Child-to-child activities, or who could pass on reports of activities known to them, please write to: Child-to-child, Room 833, Institute of Education, 20 Bedford Way, London WC1H 0AL, UK.

Follow up

A letter published in *DD32* by Dr Inkisar Ali raised the question of ORS for newborn babies. Dr Ali would like us to make clear that he is concerned about the misuse of sugar-salt solution given as food to newborns without diarrhoea. Dr Ali recognises ORT to be the best treatment for dehydration caused by diarrhoea, and acknowledges the safety of giving ORS to newborns, but draws the attention of *DD* readers to the danger of adding salt to the initial feeds of newborn babies, which can cause hypernatraemia (sodium poisoning).

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

Editor: Kathy Attawell

Editorial advisers: Professor J Assi Adou (Ivory Coast), Professor AG Billoo (Pakistan), Dr David Candy (U.K.), Professor Richard Feachem (U.K.), Dr Shanti Ghosh (India), Dr Michael Gracey (Australia), Dr N Hirschhorn (U.S.A.), Dr Claudio Lanata (Peru), Professor Leonardo Mata (Costa Rica), Dr Jon Rohde (U.S.A.), Dr Mike Rowland (U.K.), Ms EO Sullesta (Philippines), Dr Andrew Tomkins (U.K.), Dr Paul Vesin (France)
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