

When oral rehydration was first heralded as a major breakthrough, doctors thought of it primarily as a low cost means of fluid replacement: a simple substitute for IV therapy. It was promoted as a drink and as a medicine. Its purpose was to save lives by combating dehydration, or loss of water and salts. Nobody thought much about oral rehydration in relation to food or children's nutritional status. Nor did they consider food as a vital part of rehydration therapy.

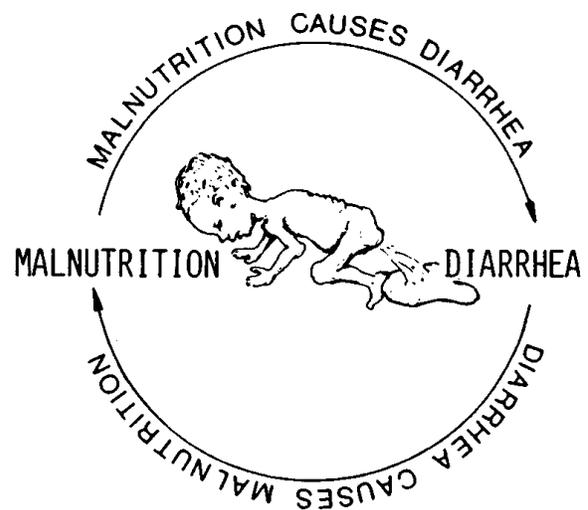
Yet the relation between nutritional status and death from diarrhea is clear. It has been known for decades that most of the children who die from diarrhea are undernourished.¹⁶⁶ While the onset of infectious disease is largely determined by environmental factors (including sanitation and hygiene), child mortality rates are linked even more strongly to nutritional status, which affects the body's ability to resist infection.¹⁶⁷ Although WHO and the principal ORT researchers emphasized the nutritional component of ORT from the early 1970s, in practice this was often lost. In fact, one of the reasons why ORT and immunization were so popular with many governments was that these simple technologies held the promise of lowering child mortality without having to resolve the more difficult underlying problems of malnutrition and poverty. As observed in Part 1, the Child Survival interventions were seen as a way to improve health (or at least survival rates) without addressing the inequities of the existing social order. As James Grant, UNICEF's Executive Director, put it: GOBI is a set of "low cost, low-risk, low resistance people's health actions which do not depend on the economic and political changes which are necessary in the longer term if poverty is to be eradicated."

Diarrhea contributes to malnutrition in four ways. First, children with diarrhea have markedly reduced appetites, resulting in significantly reduced food intake. Second, food passes through the gut more quickly than normal, allowing less time for digestion. Third, the injured walls of the intestines cannot digest and absorb food as well as they normally do (although they can always absorb some of it). Fourth, when children are ill their nutritional requirements increase as the body's rate of metabolism increases.¹⁶⁸ This means that to combat both malnutrition and infection a child with diarrhea needs more food, more often.¹⁶⁹

In a child, each episode of diarrhea causes further weight loss. As he grows thinner and weaker, the episodes of illness—including diarrhea—tend to be longer and more severe. Advanced protein-calorie malnutri-

tion (marasmus and kwashiorkor) often appears after a severe illness such as measles or persistent diarrhea. Finally, the child goes over the edge. Though the final cause of death may be dehydration, pneumonia, or tuberculosis, often this was preceded by repeated bouts of diarrhea, common infections, and increasing malnutrition.¹⁷⁰ The death of a child living in poverty usually does not result from a single episode of illness, but rather from a whole series of assaults.¹⁷¹ As Carl Taylor and William Greenough, III put it:

The diarrheal diseases and acute respiratory infections interact with malnutrition so that most of the deaths occur not because of an event but from a downward spiraling sequence of multiple synergistic combinations.¹⁷²



Which Causes Malnutrition: Infection or Lack of Food?

The proponents of Selective Primary Health Care look for ways to combat malnutrition through technological fixes rather than by correcting its root causes. In support of this position, they insist that the primary cause of malnutrition in children is not a shortage of food, but rather repeated infections.

UNICEF in its *State of the World's Children* report for 1988 asserts that:

...although not having enough to eat is still a fundamental problem in some of the world's very poorest communities, the major cause of

undernutrition in the world today is not a shortage of food in the home. It is rather a lack of basic services and a shortage of information about preventing infection and using food to promote growth. Making sure that all parents know they can protect their children's nutritional health by such means as birth spacing, care in pregnancy, breastfeeding, immunization, preventing illness, special feeding during and after illness, regularly checking their child's weight gain and supporting parents in putting that knowledge into action can overcome most, though not all, cases of malnutrition and poor growth in the world today.¹⁷³

In its 1992 *The State of the World's Children* report UNICEF flatly states that "child malnutrition is caused more by the frequency of infection than by the lack of food."¹⁷⁴ And the 1993 edition of the report goes even further, asserting that "diarrhoeal disease is also a major cause—perhaps even the major cause—of malnutrition among the developing world's children."¹⁷⁵

Thus, it is proposed that the answer to child malnutrition is to fight debilitating infections (diarrhea, pneumonia, measles) with cost-effective technological interventions (ORT, antibiotics, and immunizations). These interventions—while they indeed deserve high priority—are often introduced as selected technological interventions without an accompanying strong emphasis on actions to address the root causes of these diseases. The effect of this approach is to divert attention and resources away from the underlying causes of hunger, ill-health, and poverty.

We must question not only the politics behind this line of argument but also its biological basis. Recent evidence supports the view that malnutrition predisposes children to more severe and frequent bouts of diarrhea. The most rigorous studies on the subject suggest that malnutrition is a more significant risk factor for diarrhea than is diarrhea for malnutrition.¹⁷⁶ A recent study in rural Zimbabwe found that:

The pattern of growth of children with infrequent diarrhoea was identical to that of children with very frequent diarrhoea, and equally poor. Analysis of child growth during three month intervals showed that the weight and height increments were less during intervals with diarrhoea, but this effect was only transient as catch up occurred within a few weeks. Our findings ... indicate that *it is the lack of food rather than frequent diarrhoea that is the cause of the poor nutritional status of this community.*¹⁷⁷ (Italics added)

Another study done in Bangladesh corroborates this finding. In two villages studied, child growth faltering and undernutrition were "almost universal." In the study group of 70 children aged 5 to 18 months the aver-

age caloric intake was only 70% of the WHO recommendations. The study found that:

The effect of caloric intake ... on growth is greater than the adverse effect of diarrhea and fever combined. Specifically, if all children had energy intakes at the recommended WHO value and had even average amounts of diarrhea and fever, their weight gains would be predicted to be more than those children who had no diarrhea or fever but had median energy intakes for this population. These results suggest that, from the standpoint of children's weight gain, nutrition-intervention programs deserve as much attention as prevention and therapy of diarrhea or control of fever-inducing diseases.¹⁷⁸

The graph on the following page (adapted from the study report) shows that the monthly weight gain of children is influenced more by adequate calorie intake than by presence or absence of diarrhea and fever.¹⁷⁹

The fact that malnutrition probably does more to aggravate infection than infection does to aggravate malnutrition is also borne out by a study in China. The study found that, despite a high incidence of child diarrhea, child mortality from diarrhea was relatively low. It attributed this low death rate in part to the good nutrition enjoyed by Chinese children—a result of the country's equitable socio-economic policies.¹⁸⁰ Conversely, the fact that high diarrhea morbidity did not translate into poor nutritional status tends to confirm that infection may not be as major a determinant of poor nutritional status as has been asserted. It will be important to study whether diarrhea mortality rises as China's recent shift toward a free market approach takes effect and widens the gap between rich and poor (see page 112).

These studies concur that *malnutrition over time is a major cause of increase in the incidence of, severity of, and mortality from diarrhea.* To lower child mortality from diarrhea, one study concludes that rather than focusing on technological fixes, "Efforts could be better directed to ensure that the poor have more access to food."¹⁸¹

The Changing Concept of ORT: Food-based Therapy.

Although oral rehydration initially focused on fluids, getting enough to eat is such a key factor for child survival that it could not be left out of the equation for long. It was inevitable that the nutritional component of diarrhea management gradually came to the fore. Food is recognized as an essential part of effective oral rehydration, and ORT is currently considered to be a process of providing increased fluid *and* food to a child with diarrhea.¹⁸²

Giving food in frequent feedings to a child with diarrhea is vitally important for two reasons: *promoting rehydration and maintaining an adequate level of nutrition.*

1) *The contribution of food to rehydration.* As we touched on earlier, food intake in conjunction with oral rehydration speeds up the absorption of water through the gut.¹⁸³ When the starch and protein in food reaches the intestine, digestive juices (acids, alkalis, and enzymes) break them down into tiny molecules of sugars and amino acids. These are then carried through the lining of the gut into the bloodstream, taking water and salt with them. The greater the variety of molecules that carry the water in, the faster the total absorption. Therefore, by providing foods together with oral rehydration drinks, hydration is more effective. Thus food is essential for more efficient rehydration.¹⁸⁴ Hirschhorn suggests that improved feeding during diarrhea may have as much or more to do with mortality reduction as use of ORS. He considers that one of the most important functions of rehydration is to help the child feel well enough to eat (and the mother to respond by feeding).¹⁸⁵

2) *Nutrition and resistance to infection.* Children need plenty of food to grow well and to resist infection. Adequate food intake during diarrhea has both an immediate and extended impact on survival. In the short term, it helps to prevent death during the immediate episode by preventing increased weakness and weight loss. In the longer term, it helps sustain the child's nutritional status and defense system, decreasing both the frequency and the severity of future illnesses, including diarrhea.¹⁸⁶

There is accumulating evidence that many micronutrients—certainly Vitamin A and possibly others—independently influence mortality and severity of symptoms caused by infectious diseases. These effects are mediated by improved immunity and, in some cases, such as Vitamin A, enhanced integrity of epithelial tissues, including the gut lining. A number of studies have shown significantly reduced mortality (average 23%) from diarrheal diseases and acute respiratory infection after Vitamin A supplementation to young children in populations where some clinical deficiency

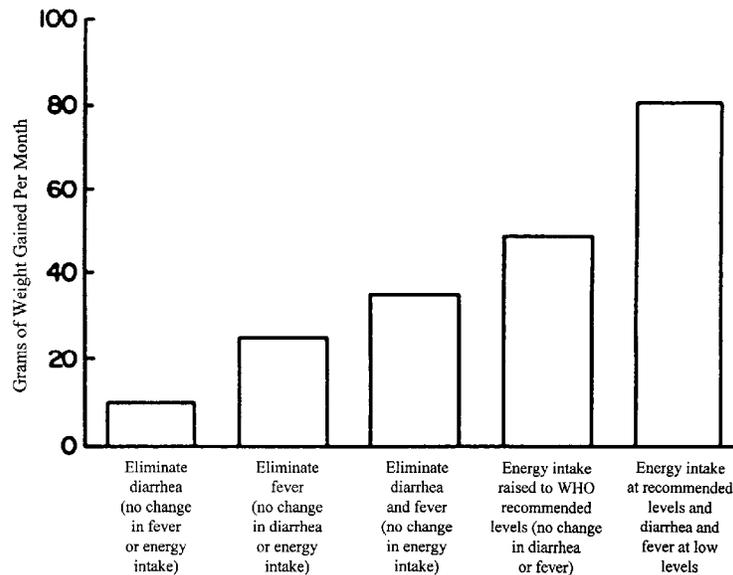


Fig. 2-5 Effect of different health measures on children's increase in weight.¹⁷⁹

exists.¹⁸⁷ Many micronutrient deficiencies are also associated with reduced appetite and slower rates of catch-up growth after episodes of infection.¹⁸⁸

Clearly, for children who are undernourished or at risk of becoming so, every effort must be made to encourage better nutrition. WHO and UNICEF quite rightly place strong emphasis on continuing to give food during diarrhea as a part of ORT, and on giving the child extra food after recovery, in order to catch up. They also correctly point out that giving a rehydration drink to a dehydrated child who refuses food will often allow the child to begin feeding again more quickly—thereby minimizing the child's nutritional deficit.¹⁸⁹

It is becoming increasingly apparent, however, that taking care to meet the child's nutritional needs only during and immediately after he has diarrhea, while it helps, is not enough. To have an optimal chance of survival, *the child needs adequate food all the time.*

Breast milk - an ideal rehydration drink

One of the best ways to prevent death from diarrhea is to promote breastfeeding. This is because *breast milk is the most nutritious food for a baby*, yet it's fluid and contains a lot of water. Breastfeeding protects infants against diarrhea, not only by helping prevent dehydration once diarrhea occurs, but also by actually warding off infection.¹⁹⁰ Thus, unlike most rehydration drinks,

the promotion of breastfeeding helps to both prevent diarrhea and to cure it. It enhances not only child survival, but nutrition, growth, and the child's overall state of health.¹⁹¹

Thirty-five studies conducted in fourteen countries found that breastfeeding was "one of the most effective ways of reducing diarrhea morbidity and mortality."¹⁹² By contrast, bottle-fed infants get diarrhea five times as often, and die from diarrhea up to 25 times as often as exclusively breast-fed infants.¹⁹³

Margaret Bentley (a consultant for WHO) and others have helped to focus attention on the importance of *maintaining adequate nutrition during the weaning period*, which is a time when many children become undernourished and die from diarrhea.¹⁹⁴ Good weaning practices are very important. But in emphasizing them, too often health educators only teach mothers about the

technical aspects of weaning. Good weaning instructions are not enough. We also need to help mothers find ways to earn sufficient wages, gain rights to sufficient land, and secure sufficient status in their communities so that they can care for and feed their children adequately and achieve a satisfactory level of health themselves.

Maternal and child health are closely linked.¹⁹⁵ A recent article by Mosley and Chen contends that malnutrition in young children "is as much dependent on maternal health factors and infections as it is on the child's nutrient deficiency."¹⁹⁶ Trying to combat malnutrition by simply combating infection, without confronting the underlying socio-economic problems, is like trying to cure diarrhea with Kaopectate. Like putting a finger in the dike, it may help partially and temporarily, but it does not resolve the underlying problem. We will return to the question of breastfeeding when we discuss the unscrupulous promotion of bottle feeding in Chapter 12.



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