



THE STATE OF
THE WORLD'S
CHILDREN
1998

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United Nations Children's Fund

Focus on Nutrition

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1998

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1998

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United Nations Children's Fund



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Malnutrition is rarely regarded as an emergency; the children affected are not facing famine and betray few or no obvious signs. Yet the largely invisible crisis of malnutrition is implicated in more than half of all child deaths worldwide and violates children's rights in profound ways, compromising their physical and mental development and helping perpetuate poverty. More widespread than many suspect — with one out of every three children affected — malnutrition lowers the productivity and abilities of entire societies. This chapter examines the scale of this intractable tragedy, the approaches that are helping resolve it and the new light that scientific research is shedding on it.

The silent emergency: In this section, the scale of malnutrition and the complex interplay of factors that cause it, including poor health services and discrimination against women, are presented. 9

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Foreword

To look into some aspects of the future, we do not need projections by supercomputers. Much of the next millennium can be seen in how we care for our children today. Tomorrow's world may be influenced by science and technology; but more than anything, it is already taking shape in the bodies and minds of our children.

In *The State of the World's Children 1998*, UNICEF — the only United Nations agency dedicated exclusively to children — spells out a simple but most pressing truth. Sound nutrition can change children's lives, improve their physical and mental development, protect their health and lay a firm foundation for future productivity.

Over 200 million children in developing countries under the age of five are malnourished. For them, and for the world at large, this message is especially urgent. Malnutrition contributes to more than half of the nearly 12 million under-five deaths in developing countries each year. Malnourished children often suffer the loss of precious mental capacities. They fall ill more often. If they survive, they may grow up with lasting mental or physical disabilities.

This human suffering and waste happen because of illness — much of it preventable; because breastfeeding is stopped too early; because children's nutritional needs are not sufficiently understood; because long-entrenched prejudices imprison women and children in poverty.

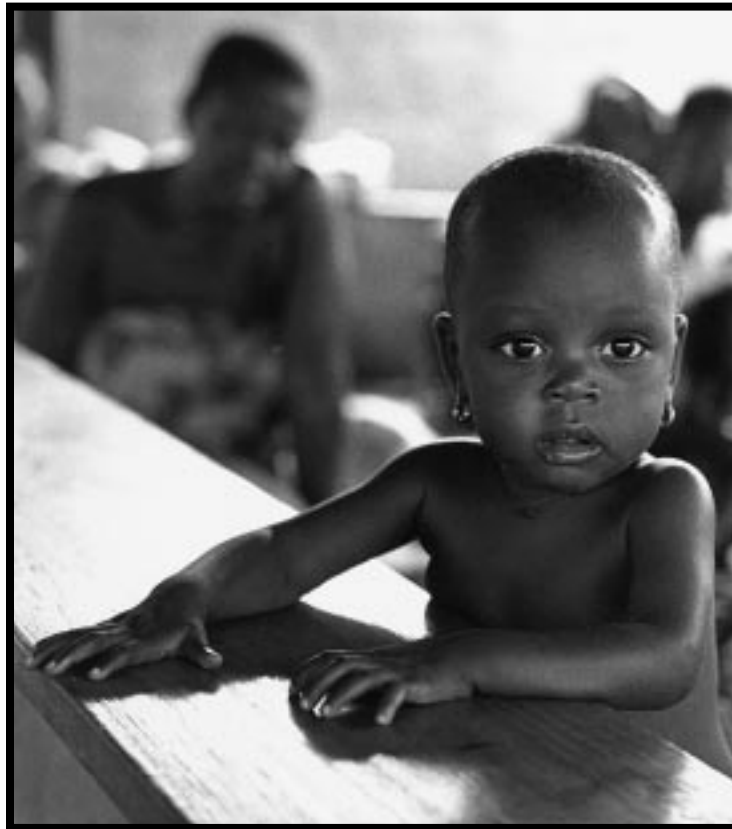
The world knows what is needed to end malnutrition. With a strong foundation of cooperation between local communities, non-governmental organizations, governments and international agencies, the future — and the lives of our children — can take the shape we want and they deserve, of healthy growth and development, greater productivity, social equity and peace.



Kofi A. Annan
Secretary-General of the United Nations

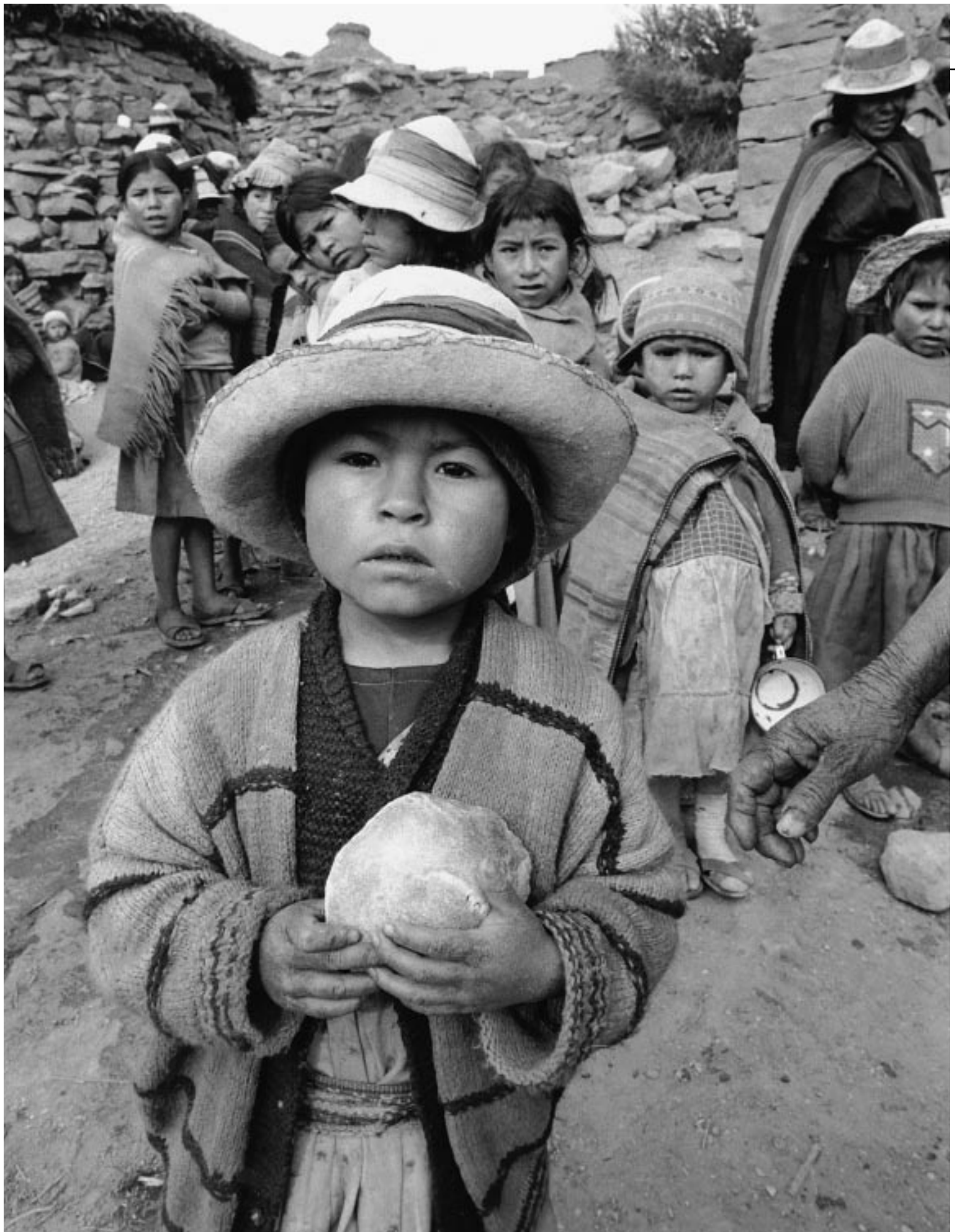
Chapter I

Malnutrition: Causes, consequences and solutions



UNICEF/282/Murray-Lee

A healthy baby girl waits in a maternal and child health centre in Benin.



The silent emergency

It is implicated in more than half of all child deaths worldwide — a proportion unmatched by any infectious disease since the Black Death. Yet it is not an infectious disease.

Its ravages extend to the millions of survivors who are left crippled, chronically vulnerable to illness — and intellectually disabled.

It imperils women, families and, ultimately, the viability of whole societies. It undermines the struggle of the United Nations for peace, equity and justice. It is an egregious violation of child rights that undermines virtually every aspect of UNICEF's work for the survival, protection and full development of the world's children.

Yet the worldwide crisis of malnutrition has stirred little public alarm, despite substantial and growing scientific evidence of the danger. More attention is lavished on the gyrations of world stock markets than on malnutrition's vast destructive potential — or on the equally powerful benefits of sound nutrition, including mounting evidence that improved nutrition, such as an adequate intake of vitamin A and iodine, can bring profound benefits to entire populations.

Malnutrition is a silent emergency. But the crisis is real, and its persis-

tence has profound and frightening implications for children, society and the future of humankind.

Malnutrition is not, as many think, a simple matter of whether a child can satisfy her appetite. A child who eats enough to satisfy immediate hunger can still be malnourished.

And malnutrition is not just a silent emergency — it is largely an invisible one as well. Three quarters of the children who die worldwide of causes related to malnutrition are what nutritionists describe as mildly to moderately malnourished and betray no outward signs of problems to a casual observer.

Malnutrition's global toll is also not mainly a consequence of famines, wars and other catastrophes, as is widely thought; in fact, such events are responsible for only a tiny part of the worldwide malnutrition crisis. But such emergencies, like the ongoing crises in the Great Lakes region of Central Africa and in the Democratic People's Republic of Korea, often result in the severest forms of malnutrition. Meeting food needs in these situations is essential, but so is protecting people from illness and ensuring that young children and other vulnerable groups receive good care.

Child malnutrition is not confined to the developing world. In some industrialized countries, widening income disparities, coupled with reduc-

More attention is lavished on the gyrations of world stock markets than on malnutrition's vast destructive potential — or on the equally powerful benefits of sound nutrition.

Photo: Improved nutrition brings profound benefits. A Bolivian girl holds a piece of bread.



UNICEF/5510/Isaac

Reducing malnutrition should be an urgent global priority; inaction is a scandalous affront to the human right to survival. A malnourished child with his mother in Afghanistan.

tions in social protection, are having worrying effects on the nutritional well-being of children.

Whatever the misconceptions, the dimensions of the malnutrition crisis are clear. It is a crisis, first and foremost, about death and disability of children on a vast scale, about women who become maternal mortality statistics partly because of nutritional deficiencies and about social and economic costs that strangle development and snuff out hope.

Malnutrition has long been recognized as a consequence of poverty. It is increasingly clear that it is also a cause.

In some parts of the world, notably Latin America and East Asia, there have been dramatic gains in reducing child malnutrition. But overall, the absolute number of malnourished children worldwide has grown.

Half of South Asia's children are malnourished. In Africa, one of every three children is underweight, and in several countries of the continent, the nutritional status of children is worsening.

Malnourished children are much more likely to die as a result of a common childhood disease than those who are adequately nourished. And research indicates a link between malnutrition in early life — including the period of foetal growth — and the development later in life of chronic conditions like coronary heart disease, diabetes and high blood pressure, giving the countries in which malnutrition is already a major problem new cause for concern.

The most critically vulnerable groups are developing foetuses, children up to the age of three and women before and during pregnancy and while they are breastfeeding. Among children, malnutrition is especially prone to strike those who lack nutritionally adequate diets, are not protected from frequent illness and do not receive adequate care.

Illness is frequently a consequence of malnutrition — and malnutrition is also commonly the result of illness. Malaria, a major cause of child deaths in large parts of the world, also takes a major toll on child growth and development. In parts of Africa where malaria is common, about one third of child malnutrition is caused by malaria. The disease also has dangerous nutritional consequences for pregnant women. In addition, pregnant women are more susceptible to malaria, and children born to mothers with malaria run a greater chance of being born underweight and anaemic.

There is no one kind of malnutrition. It can take a variety of forms that often appear in combination and contribute to each other, such as protein-energy malnutrition, iodine deficiency disorders and deficiencies of iron and vitamin A, to name just a few.

Many involve deficiencies of 'micronutrients' — substances like vitamin A and iodine that the human body cannot make itself but that are needed, often in only tiny amounts, to orchestrate a whole range of essential physiological functions.

Each type of malnutrition is the result of a complex interplay of factors involving such diverse elements as household access to food, child and maternal care, safe water and sanitation and access to basic health services.

And each wreaks its own particular kind of havoc on the human body.

Iodine deficiency can damage intellectual capacity; anaemia is a factor in the pregnancy and childbirth complications that kill 585,000 women annually; folate deficiency in expectant mothers can cause birth defects in infants, such as spina bifida; and vitamin D deficiency can lead to poor bone formation, including rickets.

Vitamin A deficiency, which affects about 100 million young children worldwide, was long known to

cause blindness. But it has become increasingly clear that even mild vitamin A deficiency also impairs the immune system, reducing children's resistance to diarrhoea, which kills 2.2 million children a year, and measles, which kills nearly 1 million annually. And new findings strongly suggest that vitamin A deficiency is a cause of maternal mortality as well, especially among women in impoverished regions (Panel 1).

At its most basic level, malnutrition is a consequence of disease and inadequate dietary intake, which usually occur in a debilitating and often lethal combination. But many more elements — social, political, economic, cultural — are involved beyond the physiological.

Discrimination and violence against women are major causes of malnutrition.

Women are the principal providers of nourishment during the most crucial periods of children's development, but the caring practices vital to children's nutritional well-being invariably suffer when the division of labour and resources in families and communities favours men, and when women and girls face discrimination in education and employment.

A lack of access to good education and correct information is also a cause of malnutrition. Without information strategies and better and more accessible education programmes, the awareness, skills and behaviours needed to combat malnutrition cannot be developed.

There is, in short, nothing simple about malnutrition — except perhaps the fact of how vast a toll it is taking.

Of the nearly 12 million children under five who die each year in developing countries mainly from preventable causes, the deaths of over 6 million, or 55 per cent, are either directly or indirectly attributable to malnutrition (Fig. 1).

Some 2.2 million children die from diarrhoeal dehydration as a result of persistent diarrhoea that is often aggravated by malnutrition.

And anaemia has been identified as a contributing factor, if not a principal cause, in 20 per cent to 23 per cent of all post-partum maternal deaths in Africa and Asia,¹ an estimate many experts regard as conservative.

If there were no other consequences of malnutrition, these horrific statistics would be more than enough to make its reduction an urgent global priority — and inaction a scandalous affront to the human right to survival.

But the issue goes beyond child survival and maternal mortality and morbidity. Malnourished children, unlike their well-nourished peers, not only have lifetime disabilities and weakened immune systems, but they also lack the capacity for learning that their well-nourished peers have.

In young children, malnutrition dulls motivation and curiosity and reduces play and exploratory activities. These effects, in turn, impair mental and cognitive development by reducing the amount of interaction children have both with their environment, and with those who provide care.

Malnutrition in an expectant mother, especially iodine deficiency, can produce varying degrees of mental retardation in her infant.

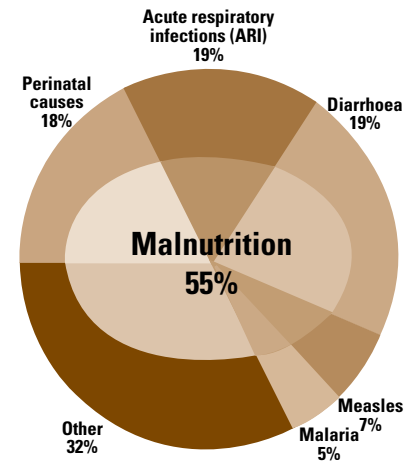
In infancy and early childhood, iron deficiency anaemia can delay psychomotor development and impair cognitive development, lowering IQ by about 9 points.

Anaemic pre-schoolers have been found to have difficulty in maintaining attention and discriminating between visual stimuli. Poor school achievement among primary school and adolescent children has also been linked to iron deficiency.²

Low-birthweight babies have IQs that average 5 points below those of

Fig. 1 Malnutrition and child mortality

If a child is even mildly underweight, the mortality risk is increased. WHO estimates that malnutrition was associated with over half of all child deaths that occurred in developing countries in 1995.



Source: WHO, based on C.J.L. Murray and A.D. Lopez, *The Global Burden of Disease*, Harvard University Press, Cambridge (USA), 1996; and D.L. Pelletier, E.A. Frongillo and J.P. Habicht, 'Epidemiological evidence for a potentiating effect of malnutrition on child mortality', in *American Journal of Public Health*, 1993:83.

Vitamin A supplements save pregnant women's lives



Gilles Vauclair

Each year, nearly 600,000 women die worldwide from pregnancy-related causes. Prenatal vitamin A supplements will help reduce this massive toll, according to preliminary results from a major new study. By measuring the impact of low weekly doses of the vitamin on the health and survival of pregnant women in southern Nepal, the study found that deaths among women receiving either low-dose vitamin A or beta-carotene supplements dropped dramatically, by an average 44 per cent.

Like many parts of the developing world, Nepal has a notoriously high maternal mortality rate — 125 times that of the United States — and vitamin A deficiency is common, particularly among pregnant women. Night-blindness, long ignored by the medical establishment and viewed by women as a routine consequence of pregnancy, but in reality a worrying sign of vitamin A deficiency, de-

velops in 10 to 20 per cent of pregnant women.

Researchers from Johns Hopkins University in the United States and the National Society for Eye Health and Blindness Prevention in Nepal, supported by the United States Agency for International Development (USAID) and Task Force Sight and Life, based in Switzerland, conducted the study to see whether maternal, foetal or infant mortality could be lowered by providing women of childbearing age one low-dose vitamin A capsule each week. Night-blindness and anaemia in women in the study and birth defects in their infants were also carefully investigated.

Approximately 44,000 young married women, nearly half of whom became pregnant during the study, were given either vitamin A supplements^a or placebos. The supplements were in the form of either pure vita-

min A or beta-carotene, the vitamin A-active ingredient found in fruits and vegetables that the body converts to vitamin A.

Among the women receiving pure vitamin A there were 38 per cent fewer deaths and among those receiving beta-carotene there were 50 per cent fewer deaths, during pregnancy and the three months following childbirth, than among women receiving no supplements.^b Anaemia, which is usually associated with iron deficiency and which is known to be a contributing cause of maternal deaths, was a surprising 45 per cent lower in the women receiving supplements who were not infected with hookworm.

Women suffering from night-blindness (an inability to see at dusk or in dim light) were found to be more likely to get infections, to be anaemic and underweight and to be at greater risk of death. Night-blindness was reduced by 38 per cent and 16 per cent, respectively, in the vitamin A and beta-carotene groups, leaving questions about the most appropriate mix of nutrients, and the amounts needed, to prevent the condition. No reduction in foetal or infant mortality through six months of age was apparent in children born to women in the study.

The scientists have not yet completed analysing the effects of supplements on the different causes of maternal deaths. However, deaths from infection are one important cause of high maternal mortality rates, and vitamin A is known to be essential for the effective functioning of the immune system that reduces the severity of infection.

The results of this study indicate that where vitamin A deficiency is common, the regular and adequate

intake of vitamin A^c or beta-carotene by women during their reproductive years can markedly reduce their risk of pregnancy-related mortality. Adequate intake of vitamin A may also dramatically reduce anaemia in pregnant women if combined with deworming.

This study helps highlight the urgent need to improve the nutrition of girls and women as part of a multi-pronged approach to reduce the tragedy of maternal mortality in the developing world and opens the way to new prevention strategies that can be widely implemented in the near future.

NOTES

a. The low-dose supplements contained 7,000 µg of retinol equivalents (RE) (23,300 IU) of vitamin A, or a similar amount of beta-carotene, which is approximately equivalent to a woman's weekly requirement.

b. Deaths were reduced from 713 per 100,000 pregnancies in the group of women not receiving supplements to 443 and 354 deaths per 100,000 respectively in women receiving the weekly vitamin A and beta-carotene supplements.

c. Although found in many foods, vitamin A has powerful biological effects and care is essential to prevent the misuse of supplements, especially by pregnant women. *High-dose (200,000 IU) vitamin A supplements of the type routinely provided at four to six monthly intervals to young children in developing countries should never be taken by women of childbearing age because of the risk of possible harm to a developing foetus. High-dose supplements may, however, be safely given to women within eight weeks following childbirth. Low-dose weekly vitamin A supplements, like those given in this study, and even lower-dose daily supplements can be taken by women during their reproductive years with little risk to mother or foetus and with considerable benefit wherever deficiency is likely.*

Photo: A mother and child in Nepal, where a recent study showed that weekly vitamin A supplements given to pregnant women substantially reduced maternal deaths.

healthy children. And children who were not breastfed have IQs that are 8 points lower than breastfed children.

The depletion of human intelligence on such a scale — for reasons that are almost entirely preventable — is a profligate, even criminal, waste.

Robbed of their mental as well as physical potential, malnourished children who live past childhood face diminished futures. They will become adults with lower physical and intellectual abilities, lower levels of productivity and higher levels of chronic illness and disability, often in societies with little economic capacity for even minimal therapeutic and rehabilitative measures.

At the family level, the increased costs and pressures that malnutrition-linked disability and illness place on those who care for them can be devastating to poor families — especially to mothers, who receive little or no help from strained social services in developing countries.

And when the losses that occur in the microcosm of the family are repeated millions of times at the societal level, the drain on global development is staggering.

In 1990 alone, the worldwide loss of social productivity caused by four overlapping types of malnutrition — nutritional stunting and wasting, iodine deficiency disorders and deficiencies of iron and vitamin A — amounted to almost 46 million years of productive, disability-free life, according to one reckoning.³

Vitamin and mineral deficiencies are estimated to cost some countries the equivalent of more than 5 per cent of their gross national product in lost lives, disability and productivity. By this calculation, Bangladesh and India forfeited a total of \$18 billion in 1995.⁴

Malnourished children's low resistance to illness diminishes the effectiveness of the considerable resources

Vitamin and mineral deficiencies are estimated to cost some countries the equivalent of more than 5 per cent of their gross national product in lost lives, disability and productivity.

What is malnutrition?



UNICEF/94-0736/Toucourij

Malnutrition is usually the result of a combination of inadequate dietary intake and infection (Fig. 6). In children, malnutrition is synonymous with growth failure — malnourished children are shorter and lighter than they should be for their age. To get a measure of malnutrition in a population, young children can be weighed and measured and the results compared to those of a ‘reference population’ known to have grown well. Measuring weight and height is the most common way of assessing malnutrition in populations.

Although many people still refer to growth failure as ‘protein-energy malnutrition,’ or PEM, it is now recognized that poor growth in children results not only from a deficiency of protein and energy but also from an inadequate intake of vital minerals (such as iron, zinc and iodine) and vitamins (such as vitamin A), and often essential fatty acids as well. These minerals are needed in tiny quantities, on the order of a few thousandths of a gram or less each day. They are con-

sequently called micronutrients. Micronutrients are needed for the production of enzymes, hormones and other substances that are required to regulate biological processes leading to growth, activity, development and the functioning of the immune and reproductive systems.

All of the minerals that the body needs — calcium, phosphorous, iron, zinc, iodine, sodium, potassium and magnesium, for example — have to come either from the food we eat or from supplements. While the body manufactures many of the complex organic molecules it needs from simpler building blocks, the vitamins — A, the B complex, C and so on — are not synthesized. Vitamin D is exceptional in that it can be made in the skin, providing a person has sufficient exposure to direct sunlight.

While micronutrients are needed at all ages, the effects of inadequate intake are particularly serious during periods of rapid growth, pregnancy, early childhood and lactation. We are learning more every day about the importance of micronutrients for the

physical and the cognitive development of children.

While widespread moderate malnutrition may not be obvious unless children are weighed and measured, some severely malnourished children develop clinical signs that are easily observed — severe wasting (or marasmus) and the syndrome known as kwashiorkor, with skin and hair changes and swelling of arms and legs. Despite years of research, the reasons why some children develop kwashiorkor and why others develop marasmus remains a mystery. What is clear is that left untreated, children with either condition are at high risk of dying from severe malnutrition, and that both kwashiorkor and marasmus can be prevented by ensuring an adequate intake of nutritious food and freedom from repeated infections. Less severe forms of malnutrition also cause death, mostly because they weaken children’s resistance to illness (Fig. 1).

The 1990 World Summit for Children singled out deficiencies of three micronutrients — iron, iodine, and vitamin A — as being particularly common and of special concern for children and women in developing countries. Recently, knowledge of the prevalence and importance of zinc for child growth and development has placed it in that league as well. Vitamin D deficiency is now recognized as a major problem of children in countries such as Mongolia, the northern parts of China and some of the countries of the Commonwealth of Independent States that have long winters.

Throughout this report, the term malnutrition is used to refer to the consequences of the combination of an inadequate intake of protein energy, micronutrients and frequent infections.

Photo: Three sisters at a health centre in Haiti.

that are spent to ensure that families have access to basic health services and sanitation. And investments in basic education by governments and their partners are compromised by malnutrition's pernicious effects on brain development and intellectual performance.

Iodine deficiency and iron deficiency anemia, which threaten millions of children, are especially worrisome factors as countries strive to improve their educational systems.

Iron-deficient children under the age of two years show problems with coordination and balance and appear more withdrawn and hesitant. Such factors can hinder a child's ability to interact with and learn from the environment and may lead to lower intellectual abilities.⁵

Severe iodine deficiency in utero can cause the profound mental retardation of cretinism. But milder deficiencies also take an intellectual toll. In the republic of Georgia, for instance, a widespread iodine deficiency, recently detected, is estimated to have robbed the country of 500,000 IQ points in the 50,000 babies born in 1996 alone.⁶

Many children suffer from multiple types of malnutrition, so numbers tend to overlap. But it is reliably estimated that globally 226 million children are stunted — shorter than they should be for their age, and shorter than could be accounted for by any genetic variation (Panel 2). Stunting is particularly dangerous for women, as stunted women are more likely to experience obstructed labour and are thus at greater risk of dying while giving birth. Stunting is associated with a long-term reduction in dietary intake, most often closely related to repeated episodes of illness and poor-quality diets.

A study in Guatemala found that severely stunted men had an average of 1.8 fewer years of schooling than

those who were non-stunted, while severely stunted women had, on average, one year less. The differences are important since every additional year of schooling translated into 6 per cent more in wages⁷ (Panel 3).

Some 67 million children are estimated to be wasted, which means they are below the weight they should be for their height — the result of reduced dietary intake, illness, or both.

About 183 million children weigh less than they should for their age. In one study, children who were severely underweight⁸ were found to be two to eight times more likely to die within the following year as children of normal weight for their age.⁹

More than 2 billion people — principally women and children — are iron deficient,¹⁰ and the World Health Organization (WHO) has estimated that 51 per cent of children under the age of four in developing countries are anaemic.¹¹

In most regions of the developing world, malnutrition rates have been falling over the last two decades, but at markedly different paces (Fig. 2). The exception is sub-Saharan Africa, where malnutrition rates began increasing in most countries during the early 1990s, following the regional economic decline that began in the late 1980s. As government budgets shrank, basic social services and health services were hit particularly hard. Per capita incomes also declined, affecting people's ability to purchase food.

In the United States, researchers estimate that over 13 million children — more than one in every four under the age of 12 — have a difficult time getting all the food they need, a problem that is often at its worst during the last week of the month when families' social benefits or wages run out.¹² Over 20 per cent of children in the United States live in poverty, more

Iron-deficient children under the age of two years show problems with coordination and balance and appear more withdrawn and hesitant. Such factors can hinder a child's ability to interact with and learn from the environment and may lead to lower intellectual abilities.

Stunting linked to impaired intellectual development

Malnutrition early in life is linked to deficits in children's intellectual development that persist in spite of schooling and impair their learning ability, according to a recent study in the Philippines. The study analysed stunting — which is low height for age and a basic indicator of malnutrition — among more than 2,000 children living in metropolitan Cebu, the Philippines' second largest city. Nearly two thirds of the children studied were stunted. Those stunted earliest in life, before six months of age, were the most severely stunted by age two, the study found. The same children scored significantly lower on intelligence tests at 8 and 11 years of age than children who were not stunted.

The study holds profound implications on a global level: 226 million children under age five in developing countries, nearly 40 per cent of this age group, suffer from moderate or severe stunting. "High levels of stunting among children suggest that there will also be long-term deficits in men-

tal and physical development that can leave children ill-prepared to take maximum advantage of learning opportunities in school. This can also have consequences for children's success later in life," says Linda S. Adair, Ph.D., Associate Professor of Nutrition at the University of North Carolina, in Chapel Hill (US), one of the researchers.

"Stunting does not directly cause poor intellectual development in children," emphasizes Professor Adair. "Rather, the same underlying factors that cause stunting are also likely to impair children's intellectual growth." Among children in Cebu, the causes include low birthweight, insufficient breastfeeding, nutritionally inadequate food given to complement or replace breastmilk, and frequent diarrhoea and respiratory infections. Stunted children tend to enter school later and miss more days of school than well-nourished children, the study also found.

The study, part of a collaborative research programme of the Office of Population Studies at the University of San Carlos in Cebu and the University of North Carolina, found that 28 per cent of the children surveyed were severely stunted. At age two, these children were nearly 11 centimeters (5 inches) shorter than children who were not stunted. The IQ scores of the severely stunted children at eight years of age were 11 points lower than those of the children who were not stunted.

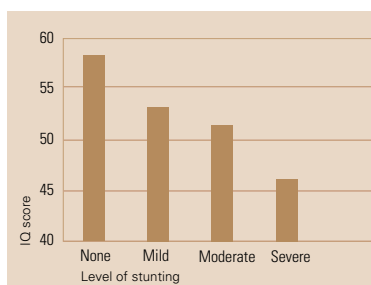
When the children in the study were tested again at age 11, those who had been most severely stunted at age 2 still scored lower on the intelligence test than children who had not been stunted, although the gap was narrower at about 5 IQ points. Children who were severely stunted



Nearly 40 per cent of all children under five in the world are stunted due to malnutrition. Many of them will also face challenges in school as a result. Here, a contrast in stature is apparent between two girls the same age in Bangladesh.

The effects of stunting

In a non-verbal intelligence test given to eight-year-olds in the Philippines, scores strongly correlated with children's level of stunting at age two. Children severely stunted at age two had the lowest test scores, while non-stunted children had scores on average 11 points higher.



also had significantly lower scores on language and math achievement tests.

Most of the children in the study were from poor families, and their diets, and those of their mothers, were below the nutritional levels recommended by the Philippine Government. They came from densely populated, poor urban communities, from newly settled areas on the outskirts of the city and from rural communities.

This study underscores the importance and lasting impact of nutrition in the crucial months of infancy and beginning before birth with sound maternal nutrition. Infants denied a strong start in life face problems in making up the lost ground, and the impact on their own development and that of their societies can be a lasting one.

than double the rate of most other industrialized countries.¹³

In the United Kingdom, children and adults in poor families face health risks linked to diet, according to a recent study that cited high rates of anaemia in children and adults, and of premature and low-weight births, dental diseases, diabetes, obesity and hypertension.¹⁴

In Central and Eastern Europe, economic dislocations accompanying the transition to market economies and major cutbacks in state-run social programmes are having a more profound effect on the most vulnerable.

In the Russian Federation, the prevalence of stunting among children under two years of age increased from 9 per cent in 1992 to 15 per cent in 1994.¹⁵ And in the Central Asian republics and Kazakstan, 60 per cent of pregnant women and young children are now anaemic.

The effects of malnutrition also cross generations. The infants of women who are themselves malnourished and underweight are likely to be small at birth.

Overall, 60 per cent of women of childbearing age in South Asia — where half of all children are underweight — are themselves underweight. In South-East Asia, the proportion of underweight women is 45 per cent; it is 20 per cent in sub-Saharan Africa.

The power of good nutrition

The devastation of malnutrition is hard to overstate, but so is the countervailing power of nutrition. Not only is good nutrition the key to the healthy development of individuals, families and societies, but there is also growing reason to believe that improving the nutrition of women and children will contribute to overcoming some of the greatest health challenges facing

the world, including the burden of chronic and degenerative disease, maternal mortality, malaria and AIDS.

The most obvious proof of the power of good nutrition can be seen in the taller, stronger, healthier children of many countries, separated by only a generation from their shorter, less robust parents, and by the better diets and more healthful, nurturing environments they enjoy.

Stronger children grow into stronger, more productive adults. Well-nourished girls grow into women who face fewer risks during pregnancy and childbearing, and whose children set out on firmer developmental paths, physically and mentally. And history shows that societies that meet women's and children's nutritional needs also lift their capacities for greater social and economic progress (Fig. 3).

Approximately half of the economic growth achieved by the United Kingdom and a number of Western European countries between 1790 and 1980, for example, has been attributed to better nutrition and improved health and sanitation conditions, social investments made as much as a century earlier.¹⁶

Even in countries or regions where poverty is entrenched, the health and development of children and women can be greatly protected or improved (Fig 4). In parts of Brazil, for example, the percentage of underweight children plummeted from 17 per cent in 1973 to just under 6 per cent in 1996, at a time when poverty rates almost doubled.

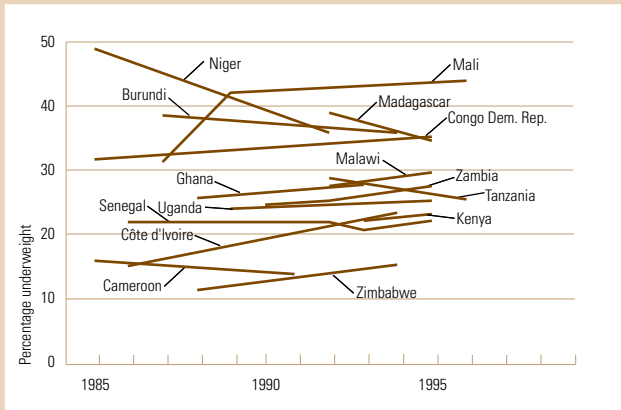
Much has already been achieved. For example, 12 million children every year are being spared irreversible mental impairment from iodine deficiency because of iodized salt. And more than 60 per cent of young children around the world are receiving vitamin A supplements.

Some effects of even severe malnutrition on a child's mental development

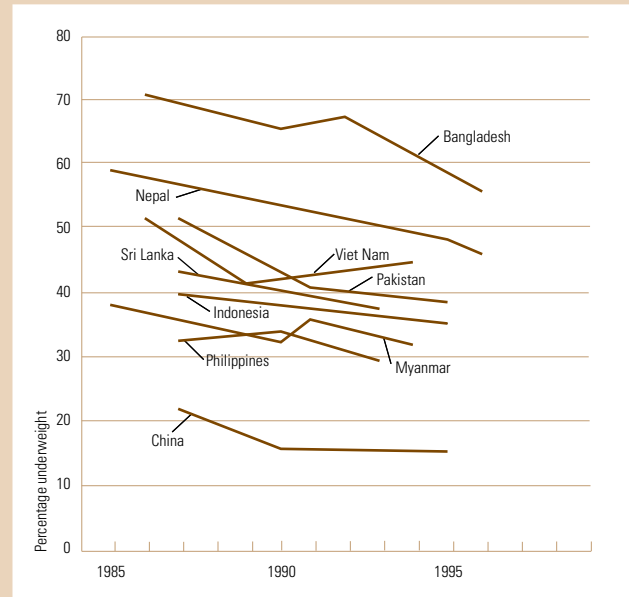
Approximately half of the economic growth achieved by the United Kingdom and a number of Western European countries between 1790 and 1980, for example, has been attributed to better nutrition and improved health and sanitation conditions, social investments made as much as a century earlier.

Fig. 2 Trends in child malnutrition, by region

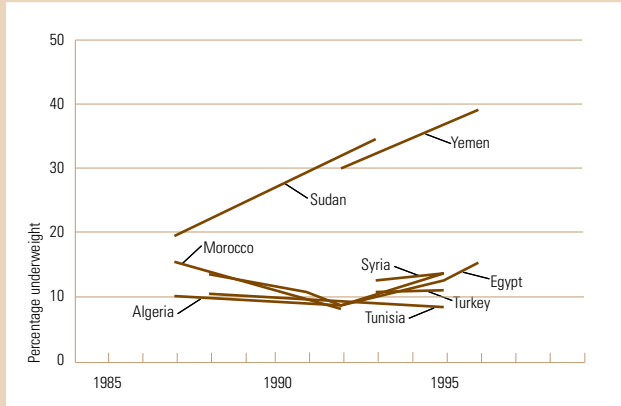
The chart shows trends in malnutrition in 41 countries, in four regions, covering over half of children under five years old in the developing world. Countries with under-five populations below 1 million are not included, even where trend data were available.



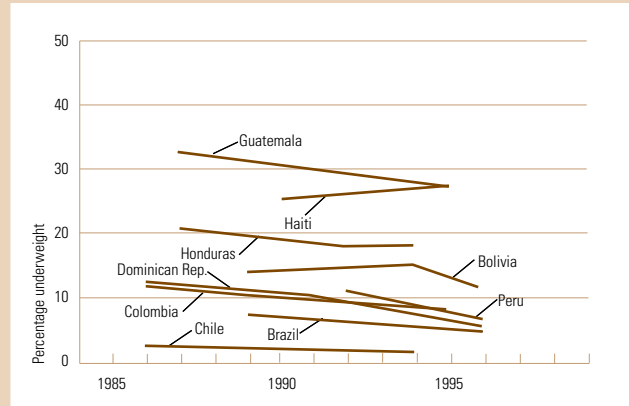
Sub-Saharan Africa



Asia and Pacific



Middle East and North Africa



Latin America and the Caribbean

Note: Malnutrition is measured as the percentage of under-five children below -2 standard deviations of the median value for the National Center for Health Statistics (NCHS) reference population for weight-for-age. Rates have been adjusted for age; data for some countries reflect rates for the under-three population.

Source: UNICEF, 1997.

can be at least partially reversed. The intelligence of severely malnourished children was found to improve markedly, for example, when health care, adequate food and stimulation were provided continually.¹⁷

And there is increasing evidence that good nutrition helps the body resist infection; that when infection occurs, nutrition relieves its severity and seriousness; and that it speeds recovery.

Thirty years ago, most people could readily accept the notion that a ‘good diet’ was beneficial to overall health. But the idea that specific nutrients could help fend off — or, even more outlandishly, help treat — specific diseases smacked of ‘fringe science’.

Today, through clinical trials and studies, the fringe is edging closer to the mainstream, as nutrition scientists as well as immunologists, paediatricians and gerontologists test the implications for public policy of large-scale interventions to improve nutrition and its effects on an array of critical physiological processes.

Malnutrition, reflected in the poor growth of children and adolescents and the high prevalence of low-birthweight babies, already has well-known effects on a child’s capacity to resist illness. It is thus reasonable to argue that in the global fight to reduce childhood death and illness, initiatives to improve nutrition may be as powerful and important as, for example, immunization programmes.

There are now numerous scientific studies that suggest, but do not yet prove, that vitamin A deficiency in a mother infected with the human immunodeficiency virus (HIV) may increase her risk of transmitting the virus to her infant.

Early in the next millennium, it is thought that between 4 million and 5 million children will be infected with HIV. The majority, mostly in sub-Saharan Africa, will acquire the infec-

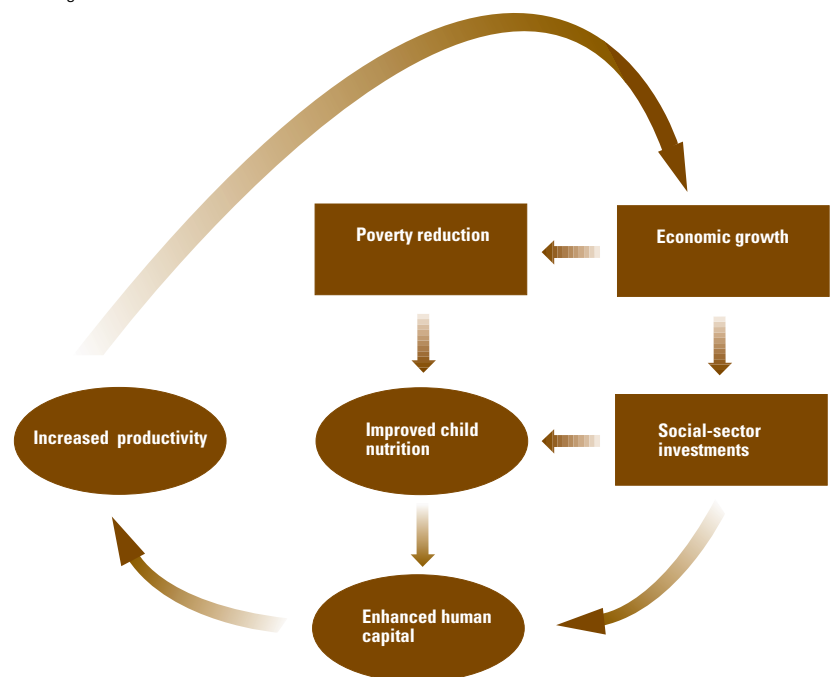
tion directly from their mothers. Although it will take another year or two to be absolutely sure, improving the vitamin A status of populations where both HIV infection and vitamin A deficiency are common may make some contribution to reducing the transmission of the virus.

The right to good nutrition

However far-reaching the benefits of nutrition may be, ensuring good nutrition is a matter of international law, articulated in variously specific language in international declarations and human rights instruments dating back to the adoption of the Declara-

Fig. 3 From good nutrition to greater productivity and beyond

Good early nutrition is most likely to result where there is economic growth, especially equitable growth; when social services become affordable and accessible; and when adequate investment is made in human resources, including the empowerment of women. Good nutrition, in turn, contributes to greater productivity and thus to economic growth.



Source: Adapted from Stuart Gillespie, John Mason and Reynaldo Martorell, *How Nutrition Improves*, ACC/SCN, Geneva, 1996.

Recognizing the right to nutrition

Nutrition has been expressed as a right in international human rights instruments since 1924. Among these are *declarations*, which are non-binding, and *conventions* and *covenants*, which are treaties carrying the force of law.

Some of these human rights milestones are noted below.

1924: Declaration of the Rights of the Child (also known as the Declaration of Geneva). Adopted after World War I by the League of Nations through the efforts of British child rights pioneer Eglantyne Jebb, the Declaration marks the beginning of the international child rights movement and is also the first international affirmation of the right to nutrition. The Declaration affirms that “the child must be given the means needed for its normal development, both materially and spiritually” and states that “the hungry child should be fed.”

1948: Universal Declaration of Human Rights. This human rights landmark, adopted by the United Nations General Assembly, proclaims in article 25 that “everyone has the right to a standard of living adequate for the health and well-being of himself and of his family, including food, clothing, housing and medical care and necessary social services” This article also affirms that “motherhood and childhood are entitled to special care and assistance.”

1959: Declaration of the Rights of the Child. Adopted unanimously by the United Nations General Assembly, the Declaration states in principle 4 that children “shall be entitled to grow and develop in health” and that children “shall have the right to ade-

quate nutrition, housing, recreation and medical services.”

1966: International Covenant on Economic, Social and Cultural Rights.

Adopted by the United Nations and ratified by 137 States as of mid-September 1997, this Covenant was the first to spell out States’ obligations to respect people’s economic, social and cultural rights. Article 11 affirms the right of everyone to an adequate standard of living, including adequate food, and the “fundamental right of everyone to be free from hunger.” The Covenant also mandates States parties to take steps to realize this right, including measures “to improve methods of production, conservation and distribution of food.”

1986: Declaration on the Right to Development.

Article 1 of the Declaration, which was adopted by the United Nations General Assembly, proclaims that the right to development “is an inalienable human right,” with all people entitled to participate in and enjoy economic, social, cultural and political development “in which all human rights and fundamental freedoms can be fully realized.” Article 8 calls for all States to ensure equal opportunity for all in access to health services and food.

1989: Convention on the Rights of the Child.

The most widely ratified human rights treaty, the Convention establishes as international law all rights to ensure children’s survival, development and protection. Article 24 mandates States parties to recognize children’s right to the “highest attainable standard of health” and to take measures to implement this right. Among key steps, States are mandated to provide medical assis-

tance and health care to all children, with an emphasis on primary health care; combat disease and malnutrition, within the framework of primary health care, through the provision of adequate nutritious foods, and safe drinking water and adequate sanitation; and provide families with information about the advantages of breastfeeding.

Ratifications: 191 States as of mid-September 1997, with only two countries — Somalia and the United States — yet to ratify.

1990: World Declaration and Plan of Action on the Survival, Protection and Development of Children.

The unprecedented numbers of world leaders attending the World Summit for Children committed themselves to “give high priority to the rights of children” in the Summit’s World Declaration. The Summit’s Plan of Action set out the steps in 7 major and 20 supporting goals for implementing the Declaration. Reducing severe and moderate malnutrition by half of 1990 levels among under-five children by the end of the century is the main nutrition goal.

The 7 supporting nutrition goals are: reduction of low-weight births to less than 10 per cent of all births; reduction of iron deficiency anaemia in women by one third of 1990 levels; virtual elimination of iodine deficiency disorders; virtual elimination of vitamin A deficiency; empowerment of all women to exclusively breast-feed their children for about the first six months; institutionalization of growth monitoring and promotion; and dissemination of knowledge and supporting services to increase food production to ensure household food security.

tion of the Rights of the Child in 1924 (Panel 4).

Under the 1979 Convention on the Elimination of All Forms of Discrimination against Women, for example, States parties must ensure that women receive full and equal access to health care, including adequate nutrition during pregnancy and lactation. And the 1990 World Summit for Children, with a Plan of Action that recognized the devastating effects of malnutrition on women and their children, set specific nutritional goals for children and women, including access to adequate food during pregnancy and lactation; the promotion, protection and support of breastfeeding and complementary feeding practices; growth monitoring with appropriate follow-up actions; and nutritional surveillance.

But the right to nutrition receives its fullest and most ringing expression in the 1989 Convention on the Rights of the Child, whose 191 ratifications as of late 1997 make it the most universally embraced human rights instrument in history.

Under the Convention, which commits States parties to realize the full spectrum of children's political, civil, social, economic and cultural rights, virtually every government in the world recognizes the right of all children to the highest attainable standard of health, to facilities for the treatment of illness and for the rehabilitation of health — specifically including the right to good nutrition and its three vital components: food, health and care.

Under the Convention's pre-eminent guiding principle, good child nutrition is a right because it is in the "best interests of the child."

Article 24 of the Convention specifies that States parties must take "appropriate measures" to reduce infant and child mortality, and to combat disease and malnutrition through the

use of readily available technology and through the provision of adequate, nutritious foods and safe drinking water.

The world is obligated to ease child malnutrition on the basis of international law, scientific knowledge, practical experience and basic morality.

The ravages caused by malnutrition on individuals, families and societies are preventable. The measures needed to reduce and end it are becoming increasingly well understood. And the gains for humanity from doing so — in greater creativity, energy, productivity, well-being and happiness — are immeasurable.

Why time is of the essence

A child's organs and tissues, blood, brain and bones are formed, and intellectual and physical potential is shaped, during the period from conception through age three.

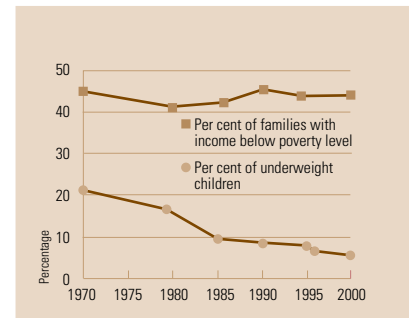
Since human development proceeds particularly rapidly for the first 18 months of life, the nutritional status of pregnant and lactating mothers and young children is of paramount importance for a child's later physical, mental and social development. It is not an exaggeration to say that the evolution of society as a whole hinges on the nutrition of mothers and children during this crucial period of their lives.

The healthy newborn who develops from a single cell — roughly the size of the period at the end of this sentence — will have some 2 billion cells and weigh an average of 3,250 grams.¹⁸ Under optimal conditions, the infant will double its birthweight in the first four months of life; by its third birthday, a healthy child will be four and a half times as heavy.

Brain cells proliferate at the rate of 250,000 a minute, beginning in the third week of gestation.¹⁹ By the time of birth, a child will have 100 billion

Fig. 4 Poverty and malnutrition in Latin America and the Caribbean

Malnutrition in Latin America decreased from an estimated 21% in 1970 to 7.2% in 1997, while the rate of poverty, measured by income level, fluctuated only slightly over the last three decades, dropping from 45% in 1970 to 44% in 1997. These trends show that the reduction of malnutrition is not solely dependent on increases in income. In Latin America, the gains in reducing malnutrition are attributed at the underlying level to good care practices and access to basic health services, including family planning, and water/sanitation services; and at the basic level to women's empowerment in terms of their education and the cash resources they control.



Source: Aaron Lechtig, 'Child Undernutrition in Latin America and the Caribbean: Trends, reasons and lessons', presented to the Workshop on the Changing Conditions of the Child in Latin America and the Caribbean, University of Notre Dame, South Bend (USA), 26 September 1997, based on ACC/SCN, 'Update of the Nutrition Situation 1996', Summary of results for the Third Report on the World Nutrition Situation, ACC/SCN, Geneva, 1996, and ECLAC, Social Panorama of Latin America 1996, Santiago (Chile), 1996.



UNICEF/98-1977/Pirozzi

Women need rest and protection from overwork during pregnancy. As long as the unequal division of labour so common around the world persists, the caring practices vital to the nutritional well-being of children will suffer. In Niger, a pregnant woman carries several large bowls of sorghum.

neurons, linked by synapses, the complex nerve junctions that begin forming in the 13th week of gestation.²⁰

Proliferating most rapidly after birth, in large part because of the stimulation and care a child receives, millions upon millions of these junctions will be forged by the time a healthy child reaches the age of two and a half. Physical, mental and cognitive development depend on these communication links between neurons. Without them, messages would dead-end, muscles would not flex, and the complex processes of thought and learning would not be possible.

Growth during the foetal stage depends on how well nourished a woman was before pregnancy, as well as how much weight she gains while she is pregnant. Gains in weight are essential for the development of new maternal and foetal tissues, and for maternal body maintenance and energy.

Since the foetus relies entirely on the mother for nutrients, pregnant women not only need to gain weight but also must maintain an optimal intake of essential nutrients such as iron and iodine.

But fulfilling these interlocking food, health and care needs can be a struggle for many women in the developing world, where economic, social and cultural factors may be a barrier to good nutrition.

Currently about 24 million low-birthweight babies are born every year, which is about 17 per cent of all live births. Most are born in developing countries, where the main cause of low birthweight is not premature birth, as it is in the industrialized world, but poor foetal growth.

Low-birthweight babies, defined as weighing less than 2.5 kilograms, are at greater risk of dying than infants of average weight. If they survive, they will have more episodes of ill-

ness, their cognitive development may be impaired, and they are also more likely to become malnourished. Evidence is also mounting that low birthweight predisposes children to a high risk of diabetes, heart disease and other chronic conditions later in life.

The measures that are essential for an expectant mother — care and rest, a reduced workload and a well-balanced diet that affords ample energy, protein, vitamins, minerals and essential fatty acids — are equally important when a woman is breastfeeding her child.

Breastfeeding perfectly combines the three fundamentals of sound nutrition — food, health and care — and is the next critical window of nutritional opportunity after pregnancy. While not all children are breastfed, it remains an important protection for children (see also page 47).

Because breastmilk contains all the nutrients, antibodies, hormones and antioxidants an infant needs to thrive, it plays a pivotal role in promoting the mental and physical development of children.

Breastfed infants not only show better immune responses to immunizations, but their intake of breastmilk also protects the mucous membranes that line their gastrointestinal and respiratory tracts, thus shielding them against diarrhoea and upper respiratory tract infections.²¹

In countries where infant mortality rates are high or moderately high, a bottle-fed baby in a poor community is 14 times more likely to die from diarrhoeal diseases and 4 times more likely to die from pneumonia than a baby that is exclusively breastfed.²²

Breastfeeding also has cognitive benefits. In one study, breastfed subjects generally had IQs that were about 8 points higher than children who had been bottle-fed, and higher achievement scores as well.²³ Nutri-

tionists theorize that the effect may be the result of the growth-promoting long-chain fatty acids of breastmilk. It may also be related to the fact that breastfed infants have fewer infections and, as healthier infants, they take a greater interest in their environment and thus learn more than ill infants.

However, for mothers infected with HIV, breastfeeding's enormous value as a bulwark against malnutrition, illness and death must be weighed against the 14 per cent risk that they may transmit the virus to their infants through breastmilk — and the vastly greater risk, especially in poor communities with inadequate water and sanitation, that feeding their children artificially will lead to infant deaths from diarrhoeal dehydration and respiratory infections.

During the second half of a child's first year, synaptic growth in the prefrontal cortex of the brain, the seat of forethought and logic, consumes twice the amount of energy required by an adult brain. Much of this synaptic growth is believed to result from the caring stimulation that an infant and young child receives — the nurturing, feeding and learning play in which parents engage their children.

After about six months, for optimal growth and development, a child needs to be fed frequently with energy-rich, nutrient-dense foods. The failure to make such investments at the right time can never be remedied later. An adequate intake of micronutrients, especially iodine, iron, vitamin A and zinc, remains crucial.

Spotlighting the causes

An understanding of the complex and subtle causes of malnutrition is important to appreciate the scale and depth of the problem, the progress achieved to date and the possibilities for further progress that exist.

Malnutrition, clearly, is not a simple problem with a single, simple solution. Multiple and interrelated determinants are involved in why malnutrition develops, and a similarly intricate series of approaches, multifaceted and multisectoral, are needed to deal with it (Fig. 5).

Immediate causes

The interplay between the two most significant immediate causes of malnutrition — inadequate dietary intake and illness — tends to create a vicious circle: A malnourished child, whose resistance to illness is compromised, falls ill, and malnourishment worsens. Children who enter this malnutrition-infection cycle can quickly fall into a potentially fatal spiral as one condition feeds off the other (Fig. 6).

Malnutrition lowers the body's ability to resist infection by undermining the functioning of the main immune-response mechanisms. This leads to longer, more severe and more frequent episodes of illness.

Infections cause loss of appetite, malabsorption and metabolic and behavioural changes. These, in turn, increase the body's requirements for nutrients, which further affects young children's eating patterns and how they are cared for (see also page 27).

Underlying causes

Three clusters of underlying causes lead to inadequate dietary intake and infectious disease: inadequate access to food in a household; insufficient health services and an unhealthy environment; and inadequate care for children and women.

□ Household food security

This is defined as sustainable access to safe food of sufficient quality and quantity — including energy, protein and micronutrients — to ensure ade-

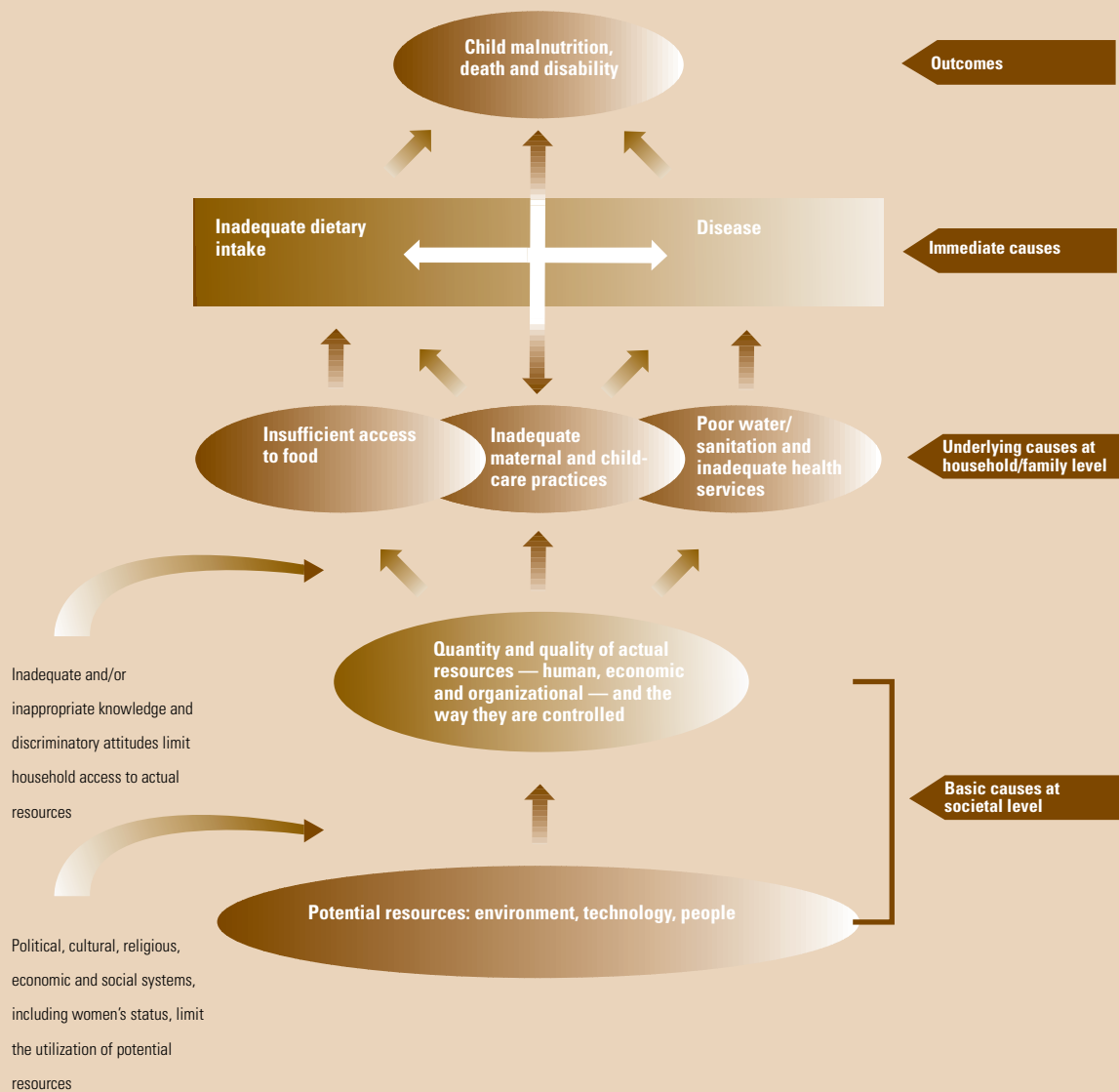


UNICEF/52357/outoutumi

A complex interplay of factors such as household access to food, women's status, caring practices, disease and access to safe water, sanitation and basic health services affect a child's nutrition. A girl stands in the doorway of her home in Lebanon.

Fig. 5 Causes of child malnutrition

This conceptual framework on the causes of malnutrition was developed in 1990 as part of the UNICEF Nutrition Strategy. The framework shows that causes of malnutrition are multisectoral, embracing food, health and caring practices. They are also classified as immediate (individual level), underlying (household or family level) and basic (societal level), whereby factors at one level influence other levels. The framework is used, at national, district and local levels, to help plan effective actions to improve nutrition. It serves as a guide in assessing and analysing the causes of the nutrition problem and helps in identifying the most appropriate mixture of actions.



Source: UNICEF, 1997.

quate intake and a healthy life for all members of the family.

In rural areas, household food security may depend on access to land and other agricultural resources to guarantee sufficient domestic production.

In urban areas, where food is largely bought on the market, a range of foods must be available at accessible prices to ensure food security. Other potential sources of food are by exchange, gifts from friends or family and in extreme circumstances food aid provided by humanitarian agencies.

Household food security depends on *access* to food — financial, physical and social — as distinct from its *availability*. For instance, there may be abundant food available on the market, but poor families that cannot afford it are not food secure.

For the poor, therefore, household food security is often extremely precarious. Agricultural production varies with the season and longer-term environmental conditions. Families selling crops may find themselves paid fluctuating prices depending on a variety of factors beyond their control, while those who need to buy food may encounter exorbitant prices.

Families living on the edge of survival have few opportunities to build up sufficient stocks of food, or to develop alternatives that would cushion them in times of hardship. So while poor families may have adequate access to food for one month, what is essential is access that is consistent and sustainable.

Women have a special role to play in maintaining household food security. In most societies, they are solely responsible for preparing, cooking, preserving and storing the family's food — and in many societies they have the primary responsibility of producing and purchasing it. For

Fig. 6 Inadequate dietary intake/disease cycle

Inadequate dietary intake and infection operate in a vicious cycle that accounts for much of the high morbidity and mortality seen in developing countries. When children don't eat enough or well enough, their immune system defences are lowered, resulting in greater incidence, severity and duration of disease. Disease speeds nutrient loss and suppresses appetite — so sick children tend not to eat as they should — and the cycle continues.



Source: Andrew Tomkins and Fiona Watson, *Malnutrition and Infection*, ACC/SCN, Geneva, 1989.

household food security to translate into good nutrition, this often overwhelming burden of work must be redistributed or reduced so that other needs of children, also related to nutrition, can be met.

Health services, safe water and sanitation

An essential element of good health is access to curative and preventive health services that are affordable and of good quality.

Families should have a health centre within a reasonable distance, and the centre's staff should be qualified and equipped to give the advice and care needed. According to the United Nations Development Programme (UNDP), access varies widely, but in as many as 35 of the poorest countries 30 to 50 per cent of the population may have no access to health services at all.²⁴

In Africa, the programme known as the Bamako Initiative was launched

Growth and sanitation: What can we learn from chickens?



UNICEF/96-0234/Routonji

Poultry farmers have known for some time that a chicken living in a dirty environment is a chicken that grows poorly. Even if it is not overtly sick all the time, it gains little weight.

Is there a message here about the growth of children? Because growth, like other nutrition outcomes, is determined most immediately by diet and illness status, the answer, at least in part, may be yes. Infectious illness — which spreads more easily in unsanitary conditions — leads to poorer dietary intake and poor use of the nutrients ingested. This, in turn, leads to lower resistance to infection, and so on, in a vicious diet-infection cycle (Fig. 6).

Now studies suggest that an unsanitary environment may have effects beyond those associated with particular bouts of illness. Researchers believe that children living in such conditions may suffer from a fairly constant, low-level challenge to their immune systems that impairs

their growth, as has been shown in domestic fowl. Dr. Noel Solomons of the Centre for Studies of Sensory Impairment, Aging and Metabolism and colleagues suggest that along with classifying children as healthy (having no clinical illness) and acutely infected (with signs of illness readily detectable), there is also a category of “inapparently infected.” Children who are inapparently infected have no signs of clinical illness but do have abnormal levels of some immunological indicators. Such inapparent infections and the chronic low-level stimulation of the immune system associated with life in unsanitary conditions may mean that nutrients go to support the body’s immune response rather than growth.

Poverty occurs in both South Asia and sub-Saharan Africa, but rates of malnutrition, especially stunting, are much higher in South Asia. A number of hypotheses have been advanced to explain this difference, and one is that it is due to poorer sanita-

tion and hygiene practices, the much greater population density and degree of overcrowding in South Asia.

Certainly, the dangers posed by poor access to potable water are well known. A recent review of data collected by the Demographic and Health Surveys, a USAID-supported project, indicates that health and nutrition benefits from improved sanitation, especially improved excreta disposal, may be even greater than those associated with better access to safe water alone.

A group led by Dr. Reynaldo Martorell of Emory University (US) has designed a study to shed light on the relationship between sanitation and growth stunting. This study would follow 800 children in two locations in South Asia and 800 more in two locations in sub-Saharan Africa from the time their mothers become pregnant to when they are two years old and would collect a wide range of information on sanitation, hygiene practices and other aspects of the household environment. The children’s growth would be measured frequently along with indicators of feeding practices, diet quality, illness and many other factors. UNICEF is helping to secure funds for this study.

Establishing a link between sanitation conditions and child growth in a cause-and-effect way will go a long way to clarifying priorities for action in this area. Such a link will also reveal just how useful the ‘dirty chicken’ model is for understanding stunted growth among children.

Photo: Unsanitary living conditions cause illnesses that threaten children’s health and growth. New research now suggests that growth is harmed in unhygienic surroundings even before acute infection occurs. In Egypt, a girl amid mounds of garbage and animal waste.

in 1987 to address the crisis in health care that came on the heels of budget cuts and economic decline in the 1980s. It is a strategy for improving health services by moving their control, management and even some of their financing out of central jurisdiction and into communities.

Now in place in a number of countries in Africa, the Initiative's principles are being adopted and adapted in other regions as well. The results are promising: The supply of basic drugs in health centres is more consistent, and management committees, composed of village residents, help ensure that people pay reasonable fees for basic services and that the funds generated are well used.

Nevertheless, the fact remains that many people do not have access to health care and may be further deterred from seeking timely and appropriate care by user fees for health care services.

The additional challenge of creating a climate where preventive health and nutritional care components are also integrated into the Bamako model is harder to realize. Because they are less tangible to communities, preventive health and nutrition services are also often less in demand than curative care. Prevention, nonetheless, is vital and cost-effective.

In terms of environmental health, the lack of ready access to a safe water supply and proper sanitation and the unhygienic handling of food as well as the unhygienic conditions in and around homes, which cause most childhood diarrhoea, have significant implications for the spread of infectious diseases.

Moreover, when food is handled under unhygienic conditions and the environment is unhealthful, littered with animal and human wastes, young children are also more prone to infection by intestinal parasites, another

cause of poor growth and malnutrition (Panels 5 and 20).

Also, women and children are usually responsible for fetching the water needed for domestic use, a task that drains considerable time and energy. Depending on how much the distance to the water source is shortened, it has been estimated that women could conserve large reserves of energy, as many as 300 to 600 calories a day.²⁵

Progress has been made in improving access to safe water. But more than 1.1 billion people lack this fundamental requirement of good nutrition.²⁶

As for sanitary waste disposal, the world is actually losing ground, with the rate of coverage falling in both urban and rural areas. Only 18 per cent of rural dwellers had access to adequate sanitation services at the end of 1994,²⁷ and overall some 2.9 billion people lack access to adequate sanitation.²⁸

□ Caring practices

Experience has taught that even when there is adequate food in the house and a family lives in a safe and healthful environment and has access to health services, children can still become malnourished.

Inadequate care for children and women, the third element of malnutrition's underlying causes, has only recently been recognized and understood in all its harmful ramifications.

Care is manifested in the ways a child is fed, nurtured, taught and guided. It is the expression by individuals and families of the domestic and cultural values that guide them.

Nutritionally, care encompasses all measures and behaviours that translate available food and health resources into good child growth and development. This complex of caring behaviours is often mistakenly assumed to be the exclusive domain of mothers. It is, in fact, the responsibility and domain of the entire family

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and the community, and both mothers and children require the care of their families and communities.

In communities where mothers are supported and cared for, they are, in turn, better able to care for young children.

Among the range of caring behaviours that affects child nutrition and health, the following are most critical:

► **Feeding:** As we have seen, exclusive breastfeeding for about six months, and then continued breastfeeding with the addition of safe, high-quality complementary foods into the second year of life, provides the best nourishment and protects children from infection.

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On the other hand, a child must have complementary foods at the six-month point, since breastmilk no longer meets all nutritional needs. Delaying the switch-over much beyond six months of age can cause a child's growth to falter.

From about 6 months to 18 months of age, the period of complementary feeding, a child needs frequent feeding — at least four times daily, depending on the number of times a child is breastfed and other factors — and requires meals that are both dense in energy and nutrients and easy to digest.

The foods a family normally eats will have to be adapted to the needs of small children, and time must be made available for preparing the meals and feeding children.

Good caring practices need to be grounded in good information and

knowledge and free of cultural biases and misperceptions. In many cultures, for instance, food and liquids are withheld during episodes of diarrhoea in the mistaken belief that doing so will end the diarrhoea. The practice is dangerous because it denies the child the nutrients and water vital for recovery.

Other behaviours that affect nutrition include whether children are fed first or last among family members, and whether boys are fed preferentially over girls. In a number of cultures and countries, men, adult guests and male children eat before women and girls.

The level of knowledge about hygiene and disease transmission is another important element of care. It involves food preparation and storage, and whether both those who prepare the food and those who eat it wash their hands properly before handling it.

Ideas concerning appropriate child behaviour are also important. If, for instance, it is considered disrespectful for a child to ask for food, feeding problems can occur.

► **Protecting children's health:** Similarly rooted in good knowledge and information is the caring act of seeing that children receive essential health care at the right time. Early treatment can prevent a disease from becoming severe.

Immunizations, for example, have to be carried out according to a specific schedule. Sound health information needs to be available to communities, and families and those caring for children need to be supported in seeking appropriate and timely health care.

Therapeutic treatment for a severely malnourished child in the hospital is far more expensive than preventive care. According to a 1990 US Department of Agriculture study,

nutrition investments for pregnant women were very cost-effective: Every \$1 spent on prenatal nutrition care yielded an average savings of about \$3 in reduced medical costs for the children during the first two months after birth.²⁹

A study in Ghana has also found savings in health care costs: Children receiving vitamin A supplements made fewer clinic visits and had lower hospital admission rates than children not receiving the supplement.

► **Support and cognitive stimulation for children:** For optimal development, children require emotional support and cognitive stimulation, and parents and other caregivers have a crucial role in recognizing and responding to the actions and needs of infants.

The link between caring stimulation and malnourished children is also important: Several studies have found that malnourished children who were given verbal and cognitive stimulation had higher growth rates than those who were not.³⁰

Breastfeeding affords the best early occasion to provide support and stimulation. It enables mothers and their infants to develop a close emotional bond that benefits both. All children need — and delight in — the kind of play and stimulation that is essential for their cognitive, motor and social development.

Verbal stimulation by caregivers is particularly important for a child's linguistic development. Ill or malnourished children who are in pain and have lost their appetite need special attention to encourage them to feed and take a renewed interest in their surroundings during recovery.

In addition to improved nutrient intake, optimal cognitive development also requires stimulation of, and regular interaction with, young children.

The quality of these actions can be enhanced through education of parents and other caregivers. Child-to-child programmes, for example, can provide simple resources to older children to improve the care, development and nutritional well-being of their younger siblings.

Policy makers need to recognize the significance of such measures and actions and take them into account when devising policy and programmes.

But the timing must be carefully planned: Many early child development activities concentrate on children who are age three and older when the focus should be on children up to the age of three and should link care, good feeding and psychosocial activities.

► **Care and support for mothers:** As long as the unequal division of labour and resources in families and communities continues to favour men, and as long as girls and women face discrimination in education and employment, the caring practices vital to the nutritional well-being of children will suffer.

Women, on average, put nearly twice the hours of men into family and household maintenance. In Bangladesh, India and Nepal, for example, girls and women spend three to five hours more a week than boys and men in tasks such as carrying fuel and growing and processing food.³¹

They then spend an additional 20 to 30 hours a week performing other unpaid household work. If the burdens they carry are not better and more equitably distributed, both they and their caring role will suffer.

The elements of care most critical for women during pregnancy and lactation include extra quantities of good-quality food, release from onerous labour, adequate time for rest, and skilled and sensitive pre- and post-natal health care from trained practitioners.



UNICEF/95-0812/Lemojine

Exclusive breastfeeding for the first six months of a child's life not only provides the best nourishment and protection from infection, but also enables mothers and their infants to develop close emotional bonds. A woman breastfeeds her three-month-old baby in the Federal Republic of Yugoslavia.

Breastmilk and transmission of HIV

Breastfeeding confers enormous benefits, preventing malnutrition and illness, saving lives and money. It is also, however, one way an HIV-positive mother could transmit the virus to her infant. A child stands the greatest risk — believed to be 20 per cent — of vertical or mother-to-child transmission during the time of late pregnancy and childbirth. There is an additional 14 per cent risk that an infant will become infected through breastmilk.

This risk of infection through breastfeeding needs to be weighed against the great dangers posed by artificial feeding: In communities where sanitation is inadequate and families are poor, death from diarrhoea is 14 times higher in artificially fed infants than in those who are breastfed. If HIV-positive women and those who fear HIV (without actually being infected) were to abandon breastfeeding in large numbers, without safe and reliable alternatives for feeding their children, the ensuing infant deaths from diarrhoea and respiratory infections could vastly outnumber those from HIV.

The dilemma facing an HIV-positive woman who does not have easy access to safe water, who does not have enough fuel to sterilize feeding bottles and prepare alternatives to breastmilk, or who cannot afford to buy sufficient formula to ensure her child's nutrition is a wrenching one that no mother can solve on her own. Support for women facing this dilemma is imperative, as the Joint United Nations Programme on HIV/AIDS (UNAIDS) made clear in 1996. The following measures are important starting points:

- Pregnant women should have access to voluntary and confidential

counselling and testing to determine their health status. If they are HIV positive, they should receive appropriate treatment to reduce the risk of vertical transmission. If they are HIV negative, health education is vital to help them and their partners remain that way.

- HIV-positive mothers should be informed of the risks of both vertical transmission through breastfeeding and infections associated with artificial feeding in their local environment. Each woman should be assisted by HIV counsellors or health professionals to understand these risks and then make her own decision.
- If an HIV-positive mother has access to adequate breastmilk substitutes that she can prepare safely, then she should consider artificial feeding. Other alternatives include wet-nursing by an HIV-negative woman, which may be acceptable in some cultures. Heat treatment of expressed breastmilk (62.5°C for 30 minutes) destroys the virus, which may be a good choice for some women.
- When mothers who test positive for HIV choose not to breastfeed but are unable to or cannot afford feeding alternatives, help will be needed from a range of parties, including governmental and partner agencies. Attention must be paid to the needs of the most disadvantaged women, which include improved water and sanitation and attentive family health care.

These measures should be part of an integrated strategy to reduce ver-

tical transmission since breastfeeding is only a small part of the problem. Access to voluntary, confidential testing and counselling is key to any strategy to reduce vertical transmission. Access to a range of prenatal and obstetric care measures associated with reduced transmission risk is also essential.

Studies now in progress will soon give a better understanding of the mechanisms, timing and risks of vertical transmission. It may be possible in a few years to offer all women low-cost, easily delivered services that will minimize or even eliminate the risk of vertical transmission. For now, access to the testing, counselling, information and other services noted above should be high priorities.

The AIDS pandemic has introduced new and volatile considerations and aspects of care into already sensitive areas of human behaviour and interaction. High priority should be given to improving access to services that help minimize the risk of HIV transmission to women before, during and after pregnancy, as well as to their partners (Panel 6).

Cultural norms and misconceptions affect the care women receive during pregnancy. In some culturally conservative communities in parts of Asia, for example, fish, meat, eggs and fat are not part of the diets of pregnant women because it is feared they will make a baby too large and difficult to deliver. Research shows, however, that better maternal diet can improve the birthweight of children in many cases without causing significantly increased head circumference of the newborn, which is the factor most likely to put small women at risk (Panel 7).

The adjustment of workload is another aspect of the care accorded women during pregnancy — and one with powerful ramifications.

A survey in one village in the Gambia, for example, found that even during periods of relatively low seasonal agricultural activity, women gained on average just 5.5 kilograms during pregnancy — only about half of the recommended weight gain that women need to sustain their developing foetus.³²

Reductions in a woman's workload during pregnancy, combined with more food of good quality, improve the nutritional status of a woman and her unborn child and reduce the risk that the child will have a low birthweight.

In Viet Nam, when men assumed some of their pregnant wives' responsibilities during the third trimester of pregnancy, women rested more, and

their infants weighed more at birth. In Indonesia, infants born to women who received a food supplement did not weigh more at birth, but they developed better during the first year of life.

The fact that women are usually the primary caregivers does not mean that men, families and communities are exempt from care-giving responsibilities.

The often oppressive and demanding patriarchal environment in which millions of women live must give way to an equal partnership in which women enjoy autonomy and the sense of accomplishment that comes from building skills and capacities.

At the same time, girls need to be free from pressures to marry early. A study in West Africa, for example, found that nearly 20 per cent of girls in rural areas of the Gambia and Senegal and 45 per cent of girls in Niger marry before the age of 15.

Figures such as these underscore the great need for girls and women to be involved in major personal decisions, including not only their marrying age but also how closely the births of their children will be spaced.

Adolescent pregnancy is a major risk factor for both mother and infant, as the girl may not have finished growing before her first pregnancy, making childbirth dangerous.

The infant of a very young mother may have a low birthweight (Fig. 7). Higher risks of toxæmia, haemorrhage, anaemia, infection, obstructed labour and perinatal mortality are all associated with childbearing in adolescence.

A number of measures are essential, therefore, to enable women and girls to develop their skills and abilities. These include ensuring their access to family and community resources, such as credit, and to education and information.

The often oppressive and demanding patriarchal environment in which millions of women live must give way to an equal partnership.

High-energy biscuits for mothers boost infant survival by 50 per cent



UNICEF/91-0873/Prozzi

In the Gambia, well-targeted interventions to improve the nutrition of pregnant women are making a difference in the birthweight of their babies, and at the same time sharply reducing the risk of babies dying during, or shortly after, birth.

A large, controlled study in the country's rural West Kiang region has determined that the number of low-birthweight babies fell by nearly 40 per cent and that stillbirth and perinatal mortality rates in infants were almost 50 per cent lower when pregnant women received a daily ration of locally prepared, energy-rich biscuits. These remarkable results strengthen the argument for providing food supplements to pregnant women to reduce low birthweight.

"The study clearly demonstrates that improved maternal nutrition, deliverable through a primary health care system, can have highly beneficial effects when efficiently targeted

at women in genuine need," says one of the study's authors, Dr. Sana Ceesay, of the Dunn Nutrition Centre affiliated with the University of Cambridge, which has been working in partnership with the Gambian Health Department. The findings were published in the *British Medical Journal* in September 1997.

UNICEF estimates that each year over 24 million babies are born below the low-birthweight threshold of 2.5 kg, and that 95 per cent of these births occur in the developing world. Low birthweight puts infants at a greatly increased risk of neonatal death and is an important cause of poor growth and development in later childhood. It can be due to a number of factors, including a woman's small size, uterine infections, smoking, low oxygen levels in the blood (due to excessive work or high altitude) and malarial infection. However, when all these factors are

equal, the incidence of low birthweight is higher in economically deprived mothers than in affluent ones.

The most likely explanation for the difference is that inadequate maternal nutrition suppresses foetal growth. It has often been difficult, nevertheless, to show real benefits to infants from improvements to a mother's diet during pregnancy. The study in the Gambia provides such evidence.

In this part of West Africa, previous studies had indicated that pregnant women — challenged as many women are by the high energy demands of water and fuel collection, agricultural work and child-care activities but also by the energy and other nutrient needs of pregnancy — did not eat enough or well enough to meet all these needs. The growth of their babies was thus threatened.

The five-year, prenatal supplementation trial covered 28 villages in one region of the Gambia. In the intervention villages, pregnant mothers received daily high-energy groundnut-based biscuits, providing 1,000 kcal/day on average after 20 weeks of pregnancy. The biscuits were made from local ingredients and were baked by two village bakers in traditional clay ovens. Women in control villages received anti-malarials, iron/folate supplements and antenatal care as did women in the intervention villages, but they did not receive the biscuits during pregnancy. Field workers weighed all the women in the study at regular intervals, and weighed and measured all infants at delivery.

The biscuit supplement caused a highly significant increase in birthweight, reducing the numbers of infants classified as low birthweight by 39 per cent. Particularly noteworthy

was the reduction in low birthweight occurring in births during the annual 'hungry season', when birthweights normally are lower than in the harvest season, as a result of poor maternal nutrition combined with hard seasonal agricultural work. (It is unlikely that food supplements would have the same impact on pregnant women who are not chronically energy-deficient.)

In addition to these remarkable benefits, this study refutes the idea prevailing in some circles that improving the diet of pregnant women will cause them to suffer higher rates of obstetrical complications because of the larger size of their newborns. Birthweight was indeed higher in the children of women who received the biscuits, but head circumference, which is the factor more closely related to pelvic disproportion in birth, was only slightly greater. The rate of obstetrical complications of this kind was not higher in the supplemented women.

Photo: A healthy newborn sleeps peacefully in the Gambia.

Basic causes

It is often said that poverty at the family level is the principal cause of child malnutrition. While it is true that a lack of resources and malnutrition often go hand in hand, this statement tells only part of the story.

Many poor families do in fact receive adequate nutrition, and malnutrition is found in many better-off families.

The broader explanation lies within a fuller understanding of the different types of resources necessary for good nutrition, and of the factors that affect families' ability to access and control these resources.

The three components of nutrition — food, health and care — interact closely in their influence on family life. Often efforts to fulfil one precondition for good nutrition compete for the same resources required to fulfil another condition.

For example, if a woman has to spend excessive time in producing food to achieve household food security, her ability to provide adequate child care can be compromised. The result may be malnutrition in her young child.

Political, legal and cultural factors at the national and regional levels may defeat the best efforts of households to attain good nutrition for all members.

These include the degree to which the rights of women and girls are protected by law and custom; the political and economic system that determines how income and assets are distributed; and the ideologies and policies that govern the social sectors.

For example, where it is known and appreciated by everyone in society — men and boys, women and girls, teachers and religious leaders, doctors and nurses — that women in the late stages of pregnancy need rest and protection from overwork, families are more apt to receive the social support they need to ensure this protection.

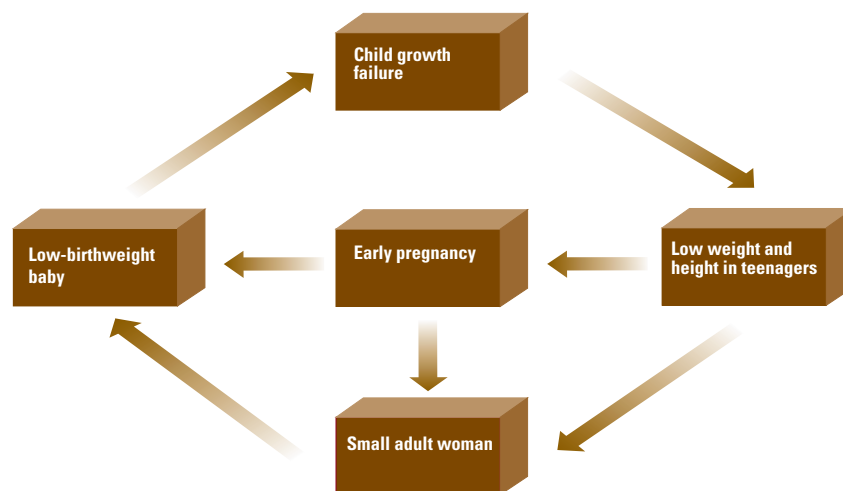


UNICEF/90-0017/Toimie

How women are valued and treated in society, including their level of education, affects their ability to feed and care for their children. A first-grader in Colombia takes lunch before class begins.

Fig. 7 Intergenerational cycle of growth failure

The cycle of poor nutrition perpetuates itself across generations. Young girls who grow poorly become stunted women and are more likely to give birth to low-birthweight infants. If those infants are girls, they are likely to continue the cycle by being stunted in adulthood, and so on, if something isn't done to break the cycle. Adolescent pregnancy heightens the risk of low birthweight and the difficulty of breaking the cycle. Support is needed for good nutrition at all these stages — infancy, childhood, adolescence and adulthood — especially for girls and women.



Source: ACC/SCN, Second Report on the World Nutrition Situation: Vol. I: Global and Regional Results, ACC/SCN, Geneva, 1992.

In places where there is a tradition of non-discrimination against women in law and custom, women are more likely to have good access to re-

sources, including credit, and to the decision-making power that can enable them to make the best use of services for themselves and their children.

* * * *

There is no doubt that while economic poverty is not the only kind of poverty that eventually affects nutrition, it is still an important factor.

Overcoming entrenched poverty and underdevelopment requires resources and inputs that few developing countries, particularly the poorest, can muster, either on their own, through existing levels of private external investment and loans, or through cur-

rent patterns of official assistance and loans.

In 1996, for example, aggregate resource flows to the developing world from all sources totalled \$232 billion, \$59 billion of which was official development loans and grants and the rest, \$156 billion, was private. Middle-income countries were the biggest recipients of the private investments and loans: Two thirds went to them and one third to low-income countries.

The two regions of the world with the highest rates of childhood malnutrition — sub-Saharan Africa and South Asia — received only \$1.6 billion and \$5.2 billion respectively.

And although bright spots exist in terms of investment and trade in sub-Saharan Africa, the problems of the continent's economies remain stark, including relatively low levels of internal demand and the import quotas industrialized countries impose on African manufactured goods.

At the same time, developing countries overall owed more than \$2 trillion in external debt in 1995. Sub-Saharan Africa, for example, paid \$13.6 billion in debt servicing in 1995 — nearly double what it spent on health services. And developing countries bear by far the greatest proportion of the global burden of disease, which drains their human and economic resources.

One potentially optimistic note in this dismal picture of declining aid flows and increasing debt is the new 'Heavily Indebted Poor Countries (HIPC) Debt Initiative' launched by the World Bank and the International Monetary Fund in 1996. This initiative is designed to assist poor coun-

tries to achieve sustainable levels of debt based on an established track record of implementing social and economic reform and on the condition additional resources are channelled to basic social services. Bolivia, Burkina Faso and Uganda will benefit from the initiative only in April 1998 or later. More generous and timely debt-relief would enable these countries and others that will hopefully soon qualify to release resources to reduce malnutrition.

If the basic causes of malnutrition are to be addressed, greater and better targeted resources and improved collaboration, participation and dialogue are needed. Awareness and information must be generated: between sections of national governments; between governments; with all development partners, donors, UN agencies, non-governmental organizations (NGOs) and investors; and above all with those whose circumstances are rarely understood or noticed, the poor themselves.

Action against malnutrition is both imperative and possible. The world, as the next part of this report explains, has already accumulated a wealth of experience and insights on which progress can be built.



UNICEF/96-0572/Toutoumji

Increased awareness and education about the causes of malnutrition are essential if the problem is to be successfully addressed. A health card in her hand, a woman holds her baby at a UNICEF-assisted health centre in Syria.