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Hunger in the 1980s

Backdrop for policy in the 1990s

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Setting the scene for the policy discussions that follow, this article reviews the global hunger situation in the 1980s. A discussion of food shortage, food poverty and food deprivation includes estimates of numbers affected by insufficient aggregate food supply, inadequate entitlement and assorted nutrient deficiencies. The wide range of underlying causes of these different problems complicates the task of reducing hunger.

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The extent of hunger in the 1980s will never be known with precision. However, a range of evidence, still emerging at the turn of the decade, provides at least an approximate picture of the situation in its multiple dimensions. Efforts to reduce the toll of hunger throughout the world require a clear understanding of its nature, its magnitude, its varying prevalence in different groups and locations, and its underlying causes. This article provides an overview of current knowledge on these issues as background for the formulation of policy against hunger in the final decade of the 20th century.

The community concerned with world hunger is far from unanimous in its understanding of the situation. As in the parable of the elephant and the blind men, hunger is perceived differently by those who come in contact with its different aspects. These varying perceptions correspond to particular disciplinary or professional orientations, lead to different diagnoses of the nature of the problem and its underlying causes, and imply distinct foci for policy interventions. One group is centrally concerned with the supply of food, a second with issues of equity and distribution, and a third with the syndromes of undernutrition. Conflicting evaluations of the impact of the green revolution, the utility of food aid, the efficacy of nutrition interventions, the role of export crops and the need for structural change fill scholarly journals, fuel popular rhetoric and confound policy prescriptions.

These perspectives may usefully be integrated within a single conceptual framework that identifies three distinct but related hunger situations: food shortage, food poverty and food deprivation.[1] These situations are distinguished primarily by the level of human organization, from population to household to individual, at which scarcity is manifested. 'Food shortage' refers to the situation in which total food supplies within a bounded region are insufficient to meet the needs of the population within that region. 'Food poverty' refers to the situation in which a household cannot obtain enough food to meet the needs of all its members. 'Food deprivation' refers to insufficient availability of food to an individual. At each level the commonly used term 'food security' can be taken as referring to the ability to avoid the corresponding hunger situation. Food shortage is among the causes of food poverty, which in turn is among the causes of food deprivation. However, other

[1]The treatment of the three hunger situations presented here is an adaptation of that developed by Robert W. Kates and Sara Millman, 'Toward understanding hunger', pp 3–24 in Lucile F. Newman, William Crossgrove, Robert W. Kates, Robley Matthews and Sara Millman, eds, *Hunger in History: Food Shortage, Poverty, and Deprivation*, Basil Blackwell, Cambridge, MA, USA, 1990. It differs from the original mainly in distinguishing between food deprivation and malnutrition.

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factors may operate to cause food poverty even when there is no shortage, and food deprivation where there is no food poverty. Below, a fuller discussion of the three hunger situations is combined with a review of the evidence on numbers affected by each at the global level and on their geographic distribution.

Food shortage

In general, food shortages occur when the mechanisms by which a region is normally provisioned fail. Harvest failures are perhaps the most obvious cause of food shortages. Shortage may also be caused or exacerbated when food production or the flow of food imports is disrupted as the result of war or shifts in the terms of trade (that reduce the availability of foreign exchange needed to purchase food imports or inputs essential to internal food production) or when governments of occupying forces appropriate excessive amounts of food, its monetary equivalent or needed inputs.

Over time, with increases in flows of goods and information over space, localized production failures have become increasingly remediable by imports of food, whether as trade or aid. At the global level, food supplies over the last several decades have been sufficient to provide an ample, although near-vegetarian, diet to all if distributed according to need.[2] However, global food supplies are not distributed according to need, and shortages at the regional, national or subnational level continue.

Taking nations as the unit of analysis, it is possible to derive indicators of shortage by comparing per capita supplies of dietary energy with nutritional requirements or with usual supplies per capita. Whichever criterion is used, a shortage does not imply that everyone within the specified area experiences hunger. Food is generally not distributed according to need within populations any more than it is across countries. In times of shortage, however, dietary intake for at least some part of the population must be less than that needed or customary.

Whether one seeks measures of food shortage, food poverty or food deprivation, the specification of nutritional requirements plays a role. The concept of nutritional requirements is a slippery one, since need is far from a constant. Requirements are affected not only by disease, but also by body size and composition, activity level, pregnancy and lactation, and climate. Even among sets of people similarly situated in terms of all these factors, the amount of inter-individual variation is substantial. Intra-individual variation is also a factor. Need varies systematically over the life cycle, and responses to nutritional constraint such as growth limitation, weight loss, activity limitation and possibly increases in the efficiency with which certain nutrients are absorbed and used may be viewed as reducing requirements. In defining average nutritional need per capita for national populations, cross-national variations in body size, age and sex distribution, and proportion of women pregnant are taken into account.[3]

As in 1986, the total per capita dietary energy supply, including imports, was less than estimated to be required for health, growth and productive work in 49 countries.[4] Of these, 31 were located in sub-Saharan Africa, six in South and Southeast Asia and six in the Western Hemisphere. Living in these countries with inadequate food supplies were some 1570 million people, 31% of the world's population.

[2]Robert W. Kates, Robert S. Chen, Thomas E. Downing, Jeanne X. Kasperson, Ellen Messer and Sara R. Millman, *The Hunger Report: Update 1989*, World Hunger Program, Brown University, Providence, RI, USA, 1989.

[3]Food and Agriculture Organization of the United Nations, *The Fifth World Food Survey*, FAO, Rome, Italy, 1987.

[4]Dietary energy supply refers to the total food calories available at retail level after allowing for animal feed, seed, storage and marketing losses, and waste. This is combined with 1985 World Health Organization/Food and Agriculture Organization/United Nations University estimates of national requirements for child growth, reproduction and active adult work: World Health Organization, *Energy and Protein Requirements. Report of a Joint FAO/WHO/UNU Expert Consultation*, WHO Technical Report Series No 724, WHO, Geneva, Switzerland, 1985. Estimates of 1984–86 dietary energy supply are taken from computer tapes of the FAO *Agristat* database, and the minimum daily calorie requirements from World Resources Institute and International Institute for Environment and Development, *World Resources 1988–89*, Basic Books, New York, NY, USA, 1988, pp 250–251.

A second indicator is based on the comparison of projected per capita national food supplies, including both domestic crops and imports, with usual consumption levels. These calculations, available for 1989/90 for a total of 55 developing countries, show an anticipated decline in per capita food availability in 26 countries with populations totalling 720 million people.[5] Projections for the 1990/91 crop year show only one country, Indonesia, moving out of this category into one in which internal production and normal imports will suffice to maintain usual consumption patterns. These countries are at risk of food shortage unless their normal means of provisioning themselves are supplemented; the calculations are intended to help avert this outcome by identifying potential need for food aid well in advance of actual shortage.

Famine

Famines, the massive hunger crises affecting large numbers within some specified region and generating substantial increases in mortality, are often equated with food shortage in popular thinking. Importantly, large-scale economic dislocations affecting certain population subgroups severely may cause famine even where food supplies are adequate.[6] Based on reports in the *New York Times*, at least three countries – Afghanistan, Ethiopia and Sudan – experienced famine in 1989. Not all members of these populations went hungry, of course; reliable data on numbers actually affected within each national population are not available.

The international food aid infrastructure that has been built up in the 1970s and 1980s[7] has enabled some progress against those famines resulting from shortage *per se*. Competing humanitarian, political and economic agendas for food aid, however, combine with time lags in diagnosis of need and in response to limit this progress. Interventions that focus on maintaining entitlement (see the discussion of food poverty below) as well as aggregate food supply seem to minimize the long-term damage associated with famine, but such efforts are still more the exception than the rule.

We are least able to deal with those famines created or exacerbated by violent conflict. Not coincidentally, each country cited above as experiencing famine in 1989 also suffered civil or ethnic conflict. 'Food wars' include a range of situations in which food production or distribution is disrupted, often intentionally, by violence. Fighting in agricultural areas, deliberate damage to crops or agricultural infrastructure, interference with transportation and sale of food, and expropriation of civilian food supplies are all common features of civil and international war. In 1988 wars (operationally defined as conflicts resulting in annual casualties of at least 1000) were fought in 22 countries. In 17 of these there was significant disruption of food production or delivery systems, either as a deliberate act of aggression or incidental to the conflict.[8]

Food poverty

Food poverty is the normal situation for many even when food is locally available, although it may also occur for a usually food-secure household if its own subsistence production fails, or if shortage or rising

[5]Ray W. Nightingale, *World Food Needs and Availabilities, 1989/90: Winter*, United States Department of Agriculture, Economic Research Service, Washington, DC, USA, 1989.

[6]Amartya Sen, *Poverty and Famines: An Essay on Entitlement and Deprivation*, Clarendon Press, Oxford, UK, 1981.

[7]Sara R. Millman, Stanley Aronson, Lina Fruzzetti, Marida Hollos, Rose Okello and Van Whiting, Jr, 'Information, organization, and entitlement in the emerging global food system', pp 307–330 in Newman, *et al, op cit*, Ref 1.

[8]Data on wars are derived from Ruth Leger Sivard, *World Military and Social Expenditures, 1989*, 13th ed, World Priorities, Washington, DC, USA, 1989. The judgement as to which wars have involved substantial disruption of civilian food systems is from Ellen Messer, 'Food wars', in Robert S. Chen, general ed, *World Hunger Report 1990*, Alan Shawn Feinstein World Hunger Program, Brown University, Providence, RI, USA, 1990.

prices reduce access to food. Entitlement, or a household's access to food based on its socially recognized control over certain resources,[9] is intimately linked to household food security, and the failure or ongoing inadequacy of a household's entitlement mechanisms implies food poverty. Since entitlements may rest on the household's ability to grow food on its own land, exchange labour or products for food, or draw on support from outside the household, the causes of food poverty may include insecure land tenure, insufficient size of landholdings, poor quality of land, unemployment, low wages and the failure of any customary back-up entitlement mechanisms (eg food relief).

The World Bank and the Food and Agriculture Organization (FAO) of the United Nations have generated sets of national-level estimates, corresponding closely to the concept of food poverty, of the numbers of people living in households that cannot afford an adequate diet. These estimates combine distributions of population by per capita calories available to the household with a cutoff value for per capita caloric requirements corresponding to some level of specified dietary adequacy. Households whose ability to obtain food falls below some specified threshold of required dietary energy are considered at risk of hunger or undernourished. The distribution of population by per capita caloric availability within the household is itself estimated from a range of household-level income, food expenditure and food consumption data, adjusted with annually updated figures for per capita caloric availability for the population as a whole. Extrapolating from older World Bank and FAO studies, it is estimated that, in 1988, 1015 million people in developing countries lived in households too poor to obtain the energy sufficient for work and 455 million lived in households too poor to obtain the energy sufficient for minimal activity among adults and for the healthy growth of children.[10] These food-poor households – using either measure of food poverty – are located mainly in South Asia and Africa. Over the last 36 years, according to one extension of the FAO's food poverty measure, the number of food poor has stayed relatively constant, while the proportion of the food poor in the world has decreased by half.[11]

Updates of some of the inputs required for calculation of these food poverty estimates are infrequent. To the extent that the true situation has changed in ways that should be captured by altering these inputs, the necessity of reliance on older data renders the estimates insensitive to real change in numbers in food poverty caused by these factors. For example, it is often argued that economic difficulties in some developing countries over the last decade have resulted in increasingly unequal income distributions. If this is so, actual numbers in food poverty will be greater than the estimates derived using old income-distribution data. On the other hand, if food-security policy interventions have improved access to food most for those households previously in food poverty, reliance on old data will bias food poverty estimates upwards. Efforts are now under way to make the statistical base more sensitive to current conditions, and especially to improve the capacity for monitoring the effects of structural adjustment policies on food poverty.[12] But scattered reports in the 1980s indicated deteriorating living standards and civil disorder in many countries in response to increases or anticipated increases in the prices of foodstuffs and other necessities.

Such national-level estimates of numbers in food poverty, even if reasonably accurate, are uninformative as to which households are

[9]Sen, *op cit*, Ref 6; Jean Drèze and Amartya Sen, *Hunger and Public Action*, Clarendon Press, Oxford, UK, 1990.

[10]Shlomo Reutlinger and Marcelo Selowsky, *Malnutrition and Poverty: Magnitude and Policy Options*, World Bank Staff Occasional Paper No 23, Johns Hopkins University Press, Baltimore, MD, USA, 1976; FAO, *op cit*, Ref 3; Administrative Committee on Coordination/Subcommittee on Nutrition, *First Report on the World Nutrition Situation*, ACC/SCN, United Nations, Rome, Italy, 1987. The World Bank and FAO estimates have been inflated to reflect 1988 population and to incorporate a recent estimate of the number of food-poor in China (see Kates *et al, op cit*, Ref 2, for further details).

[11]Kates *et al, op cit*, Ref 2, p 8, based on data from David Grigg, *The World Food Problem 1950–1980*, Basil Blackwell, Oxford, UK, 1985.

[12]These include the World Bank effort to undertake studies of basic living standards in selected developing countries, Unicef/WHO efforts to monitor child undernutrition in 20 countries (WHO, *Strategy for Improved Nutrition of Mothers and Children in the Developing Countries: Concepts Shared by WHO and UNICEF*, WHO, New York, NY, USA, 1988), the Inter-Agency Food and Nutrition Surveillance Programme (IFNS) recently initiated by the FAO, WHO and Unicef Administrative Committee on Coordination/Subcommittee on Nutrition, *Update on the World Nutrition Situation: Recent Trends in Nutrition in 33 Countries*, ACC/SCN, United Nations, Geneva, Switzerland, Jan/Feb 1989) and national efforts to measure change in nutritional status through the use of 'sentinel sites' as in Mexico.

food-poor. The experience of food poverty is not distributed randomly among households, but often varies systematically along lines defined by membership in various groups. Food poverty is not a perfect function of poverty in the more general sense. It is certainly possible to define a poverty threshold below which on average households will be unable to meet their members' caloric needs, and above which on average these needs are met. However, some households below the cutoff will manage to feed their members adequately, and some above it will not. More important, even knowledge as to which people are poor is not always available.

Some generalizations, such as the association of poverty with illiteracy, probably apply everywhere. Others, such as the pattern of disadvantage associated in developing countries with rural as opposed to urban residence, seem to hold very widely but not universally. Variations related to membership in still other sorts of population subgroups may operate in ways that cannot be generalized across populations at all. For instance, members of the Scheduled Castes in India are often worse nourished than others in the same areas.[13] Ethnic, religious or cultural groups often differ in terms of their bases of entitlement, and to some extent the association of food poverty with membership in particular groups may be explained in these terms. Group membership may also define distinct coping strategies and capacity for response to emergency, as well as the likelihood that resources of the larger society can be drawn upon in times of need or that such need is ignored. Relations of oppression or exploitation within societies do much to determine which households live at or near the margin of subsistence.

Group membership may coincide with location, as when the group in question is a community. Based on data for 57 developing countries between 1977 and 1985, the median proportion of a country's urban population below the absolute poverty level was 28%. The comparable figure for rural areas was 48%. Since absolute poverty was defined as 'that income level below which a minimum nutritionally adequate diet plus essential non-food requirements is not affordable', the correspondence to the concept of food poverty is close.[14] Comparisons based on nutritional surveys frequently show markedly higher rates of malnutrition among rural as compared to urban children. Where results of such studies are presented separately for areas within countries, sharp variations in the prevalence of malnutrition by geographic location are also common.[15] Clearly location within countries matters for the prevalence of hunger, although no meaningful cross-national generalization emerges as to which subnational regions are at greatest risk.

Often, however, group membership and location will form cross-cutting dimensions of classification. In such cases explicit attention to group membership may be necessary to understand which households within a particular area (or within a set of areas) are likely to experience food poverty.

By way of comparison with these developing-country estimates, it is of interest to consider hunger in the US and other industrialized nations. The most often cited estimate for hunger in the US is 20 million people, a figure based on the number of people whose income falls below the poverty level (as defined in the US, employing an income cutoff far higher than those defining poverty in developing countries) and who are probably not receiving food-stamp supplements.[16] Numbers who cannot

[13]See, eg, K. Subbarao, *Improving Nutrition in India: Policies and Programs and Their Impact*, World Bank Discussion Papers No 49, World Bank, Washington, DC, USA, 1989.

[14]*The State of the World's Children 1988*, Oxford University Press, New York, NY, USA, 1988, pp 74–75.

[15]WHO, *Global Nutritional Status: Anthropometric Indicators, Update 1989*, WHO Nutritional Unit, Division of Family Health, Geneva, Switzerland, 1989.

[16]Physician Task Force on Hunger in America, *Hunger in America: The Growing Epidemic*, Wesleyan University Press, Middletown, CT, USA, 1985.

afford adequate dietary energy, the criterion employed in the international food poverty estimates cited above, would presumably be lower. Although the quality of the diet may be lacking, caloric content *per se* is likely to be adequate for most of even the poor in the US. According to government, church and health organizations recently surveyed in 34 industrialized, middle-income or centrally planned economies, hunger among children is either not a problem at all or is restricted to certain small population subgroups.[17] Although some of these reports may well be over-optimistic, they reflect public perceptions and suggest at least that the extreme forms of hunger so familiar in much of the Third World are relatively rare in wealthier countries.

Food deprivation

Wherever there is hunger, there are food-deprived individuals: people whose access to or consumption of food is insufficient to meet their usual needs. Often, the cause of individual food deprivation is food poverty: the household's insufficient access to food. Even within households that can afford to feed all their members adequately, however, food deprivation may occur as a result of deliberate self-denial, misunderstood need, abuse, neglect or loss of appetite associated with disease.

Food deprivation and disease jointly cause undernutrition, the set of physiological syndromes associated with insufficient quantities of various nutrients actually absorbed relative to amounts needed. Disease and food deprivation are reciprocally related. That is, when food deprivation causes malnutrition, malnutrition itself then increases the individual's vulnerability to certain infectious diseases. In turn, disease increases the likelihood of food deprivation when it reduces appetite or when dietary limitations are employed as therapy. Disease may also lead to malnutrition even when food consumption is unaffected, if it reduces absorption or increases requirements of specific nutrients. The direct consequences of food deprivation may include: weight loss; impaired growth, development and functioning; restricted activity; morbidity; and ultimately death. The complex relations of food deprivation and disease make their effects on nutritional status difficult to separate empirically. Nonetheless, the conceptual distinction between food deprivation and undernutrition is important because of the very difficult foci for intervention that are appropriate depending on the relative importance of disease or deprivation in particular instances of undernutrition.

Vulnerable groups

Pregnant and lactating women and children under 5 years of age are often identified as especially vulnerable to hunger. If intake is not adjusted to meet the additional requirements imposed by gestation and lactation in a mother or by growth and development in a small child, food deprivation will be more frequent for mothers and small children than for others. Because of the importance and time-bounded nature of these processes, and their dependence on adequate nutrition, the experience of food deprivation may also be more consequential for mothers and small children than for others.

In addition to misunderstood need, customary patterns in intra-household food allocation that discriminate against women or children

[17]Noyes found the lack of any common definition or measure of hunger was a key problem that complicated any attempt to form a global picture of hunger; see Dorothy Noyes, 'Hunger among children in "rich" countries', in *Briefing and Abstract Book*, Hunger Research Briefing and Exchange, Alan Shawn Feinstein World Hunger Program, Brown University, Providence, RI, USA, 1990.

may be important factors in some settings. The strongest evidence appears in the many ethnographic reports of diet and feeding customs that favour males. The unusually low survival rates of females as compared to males in parts of South Asia, reversing the usual pattern of female advantage, are also cited as evidence of discrimination. However, anthropometry for the same regions often shows no gender contrast in proportions undernourished. Although it is clear that males are favoured in some settings, the specific advantages they enjoy are not always dietary; for example, access to medical care is sometimes greater for boys than for girls even where no nutritional difference is apparent.[18] The documentation of general abuse or neglect of children, the elderly or unrelated household members is scantier. Infanticide is practised in many parts of the world. Since ethnographic reports tell of customary abandonment of elderly members of households, particularly in harsh environments. Unrelated household members such as servants or slaves may be regularly deprived, especially in times of food shortage. However, the available evidence is insufficient to support either quantitative estimates of the prevalence of discriminatory patterns of intra-household food allocation or firm generalizations as to characteristics of the targets of discrimination.

A mother's ability to produce adequate amounts of high-quality milk is surprisingly robust despite shortcomings in her own diet. But the extremes of maternal malnutrition may impair foetal development and jeopardize the availability of breast milk to the infant. In addition, the cumulative nutritional drain of repeated (especially closely spaced) pregnancies and extended periods of lactation, under conditions of inadequate dietary intake and heavy workloads, is often thought to produce a maternal depletion syndrome. This condition manifests itself as a number of specific deficiency diseases and more broadly as premature ageing and exhaustion.

Hunger's toll on children is in their low birth weights, in the stunting of their growth, in their diarrhoea-related deaths, and, especially in Asia, in vitamin-A-deficiency blindness and iodine-deficiency neurological disorders. Some 4 million children a year – 28% of those who die before the age of 5 – die of dehydration, the most life-threatening effect of diarrhoea.[19] Millions more suffer wasting, particularly from malaria, measles and other high-fever diseases that both cause loss of appetite and place additional demands on nourishment. Three million children under the age of 10 are blind because of insufficient intake of vitamin A. Over a broader span of ages, a similar number of people suffer from cretinism originating from maternal iodine deficiency during gestation.[20]

More than one-fourth of the world's small children are underweight for their age, and one-sixth of the world's infants are born underweight.[21] The prevalence of malnutrition among children varies markedly both across and within countries. An extraordinarily high 67% of children under age 5 are underweight in South Asia, although controversy continues over the appropriateness of the standard used.[22] Relatively high proportions of underweight children are also found in Southeast Asia and in sub-Saharan Africa. China, with 17% underweight, has made remarkable progress in recent decades: data for older children (7–10 years old) show increases in height of an inch or more (2.5–3.6 cm) per decade over 1950–80.[23] Within countries, studies that compare the frequency of underweight among children in cities and the

[18]Barbara Harriss, 'The intrafamily distribution of hunger in South Asia', paper presented at the Seminar on Food Strategies at the World Institute for Development Economics Research (WIDER), Helsinki, Finland, 21–25 July 1986.

[19]James Grant, *The State of the World's Children 1990*, Oxford University Press, New York, NY, USA, 1990.

[20]Vitamin A estimate from ACC/SCN, *op cit*, Ref 10, p 33, based on WHO, *Prevention and Control of Vitamin A Deficiency and Nutritional Blindness: Proposal for a Ten-Year Programme of Support to Countries*, Doc Nut/84.5 Rev 1, WHO, Geneva, Switzerland, 1985; for details, see Kates *et al*, *op cit*, Ref 2, or John B. Mason, 'Introduction and policy implications', in Keith P. West, Jr, and Alfred Sommer, *Delivery of Oral Doses of Vitamin A to Prevent Vitamin A Deficiency and Nutritional Blindness: A State-of-the-Art Review*, ACC/SCN Series, Nutrition Policy Discussion Paper 2, Administrative Committee on Coordination/Subcommittee on Nutrition, Food Policy and Nutrition Division, Food and Agriculture Organization of the United Nations, Rome, Italy, 1987, p 4. Some 3.15 million people of all ages are said to suffer from cretinism (see ACC/SCN, *op cit*, Ref 10, p 40). No estimates are readily available for the number of children newly afflicted by cretinism in any one year.

[21]The estimate for underweight children is based on data from the ACC/SCN, *op cit*, Ref 10, pp 8–31. The estimate for underweight infants is from *The State of the World's Children 1987*, Oxford University Press, New York, NY, USA, p 116, based on figures from surveys conducted in 1982 ('The incidence of low birthweight: an update', *WHO Weekly Epidemiological Record*, Vol 59, No 27, 1984, pp 202–212), updated with birth estimates from 1986. See Robert W. Kates, Robert S. Chen, Thomas E. Downing, Jeanne X. Kasperson, Ellen Messer and Sara R. Millman, *The Hunger Report: 1988*, World Hunger Program, Brown University, Providence, RI, USA, 1988.

[22]Some analysts claim that Western growth standards, used as the basis for judging nutritional adequacy worldwide, are inappropriate for Asian populations. They argue that small size may be adaptive to the limited dietary energy available, and that South Asians may be genetically smaller. South Asian children therefore may grow less than healthy, well-nourished Western children, but without being 'undernourished' (eg David Seckler, 'Small but healthy: a basic hypothesis in the theory, measurement, and policy of malnutrition', pp 127–137 in P.V. Sukhatme, ed, *Newer Concepts in Nutrition and Their Implications for Policy*, Maharashtra Association for the Cultivation of Science, Pune, India, 1982). Nutritionists respond that growth retardation

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countryside typically report higher proportions of hungry children in rural areas.[24] The data that record underweight by age provide a clue to one source of children's undernutrition, the critical process of weaning. In many countries the percentage of underweight children increases throughout infancy, peaking in the second year. This pattern suggests that the transition to the adult diet is often more problematic than a child's initial diet.[25] Despite continuing statements of concern about the possibility of widespread breastfeeding decline in developing countries from some international bodies,[26] recent evidence suggests that a situation of stable or even increasing breastfeeding is now common.[27]

Nutrient deficiency disease

Protein-energy malnutrition. In contrast to earlier thinking, current assessments suggest that protein deficiency occurs mainly in combination with insufficient caloric intake rather than where dietary energy is adequate. Nutritionists now argue that most diets that meet caloric requirements also provide adequate amounts of protein.[28] Yet some groups, primarily those for whom the starchy staple is a (low-protein) root crop or fruit such as cassava or bananas rather than a (relatively protein-rich) grain, clearly remain vulnerable to protein deficiency even when dietary energy is adequate. Even where the adult diet contains enough protein, young children may be at risk of protein deficiency if weaning foods omit the richer protein sources available to older people. Protein-energy malnutrition, in which both protein and caloric intake are inadequate, is far more common. Its occurrence among young children, in settings where weaning food reflects diets that are adequate for adults, is often related to the small volume of food an infant or toddler can consume at a meal (and hence a need for more frequent feedings or more nutrient-dense weaning foods) or to the effects of common childhood diseases on food intake and absorption.

Iron. By far the most common variety of anaemia stems from iron deficiency. Anaemia is particularly common among women of reproductive age and very young children, although it is not restricted to these groups. Even in its milder forms it may limit the physical activity and impair the development of children, cause fatigue, compromise work performance and alter mental functioning. For pregnant women it increases risks of maternal and foetal morbidity and mortality and low birth weight. An estimated 51% of the world's pregnant women, and 43% of its children under 5, are anaemic. The prevalence is higher for the developing countries, and it is highest of all in Africa and South Asia.[29]

Vitamin A. Deficiencies of vitamin A are most prevalent in South and Southeast Asia (especially Bangladesh, India and Indonesia), with smaller concentrations in Africa, the Near East and the Americas. Vitamin A deficiency has long been considered an important cause of blindness; some recent research suggests that it also sharply decreases resistance to certain infectious diseases. It affects the vision and health of adults – mainly pregnant and lactating mothers – and some 42 million preschool children.[30]

Iodine. Deficiencies of iodine occur mainly within rather clearly defined

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may lower nutritional requirements, but not without functional impairment (Reynaldo Martorell, 'Body size, adaption and function', *Human Organization*, Vol 48, No 1, 1988, pp 30–38; and Nevin Scrimshaw and Vernon R. Young, 'Adaptation to low protein and energy intakes', *Human Organization*, Vol 48, No 1, 1988, pp 20–29).

[23]Alan Piazza, *Food Consumption and Nutritional Status in the PRC*, Westview Press, Boulder, CO, USA, 1986, p 138; ACC/SCN, *op cit*, Ref 12, pp 112–115.

[24]FAO, *op cit*, Ref 3, p 44; Government of Swaziland, US Centers of Disease Control, and US Agency for International Development, *Swaziland National Status Survey, 1983: Full Report*, US Government Printing Office, Washington, DC, USA, 1983; Pan American Health Organization, *The National Food and Nutrition Survey of Guyana*, PAHO Scientific Publication No 323, World Health Organization, Geneva, Switzerland, 1976.

[25]WHO, *Nutrition: Global Surveillance through Anthropometric Measurements*, Parts I–IV (reprinted from *WHO Weekly Epidemiological Record*, Vol 62, No 7, 1987, pp 37–38; No 8, pp 45–50; No 9, pp 57–59; No 10, pp 64–66; No 11, pp 71–73; No 12, pp 78–80), WHO, Geneva, Switzerland, 1987.

[26]Eg Grant, *op cit*, Ref 19.

[27]Sara Millman, *Breastfeeding in Eighteen Developing Countries*, Family Health International, Research Triangle Park, NC, USA, 1987; Ravi K. Sharma, Shea O. Rutstein, Miriam Labbok, Gilberto Ramos and Sofians Effendi, 'Trends and differentials in breastfeeding: findings from WFS and DHS surveys', paper presented at the annual meeting of the Population Association of America, Toronto, Canada, May 1990; James Trussell, German Rodinguez, Laurence Grunner-Strawan and Mark van Landingham, 'Trends and differentials in breastfeeding behavior: evidence from the WFS and DHS', paper presented at the annual meeting of the Population Association of America, Toronto, Canada, May 1990.

[28]C. Gopalan, 'Kwashiorkor and marasmus: evolution and distinguishing features', pp 49–58 in R.A. McCance and E.M. Widdowson, eds, *Calorie Deficiencies and Protein Deficiencies*, Churchill, London, UK, 1968; D.S. McLaren, 'The great protein fiasco', *Lancet*, Vol 88, 1974, pp 93–96; J.C. Waterlow and P.R. Payne, 'The protein gap', *Nature*, Vol 258, No 5531, 1975, pp 113–117.

[29]E.M. De Maeyer, *Preventing and Controlling Iron Deficiency Anaemia through Primary Health Care*, World Health Organization, Geneva, Switzerland, 1989.

[30]Donald S. McLaren, 'Global occurrence of Vitamin A deficiency', pp 1–18 in J.C. Bauernfeind, ed, *Vitamin A Deficiency and Its Control*, Academic Press, New York, NY, USA, 1986; Mason, *op cit*, Ref 20, p 7.

geographic pockets throughout the world. Although most familiar in its severe clinical forms – goitre and cretinism – it is increasingly recognized that even milder iodine deficiency can impair mental and motor skills. Resulting from near-exclusive consumption of crops grown in soil lacking iodine or animal products raised on such iodine-deficient plant foods, the problem is most common in those isolated areas where too little of the food consumed is brought from outside to compensate for the lack of iodine in those foods produced locally. An estimated 190 million people worldwide suffer from iodine deficiency.[31] Most are found in market-isolated areas of South and Southeast Asia. Smaller concentrations occur in Africa and Latin America.

Afterwords

This consideration of evidence on global hunger in the 1980s has yielded some insights regarding not only its overall magnitude but also its nature, its underlying causes and its variation across different locations and groups. Hunger is not a single, uniform experience. Its manifestations range from the aggregate food-supply shortfalls most persistently associated with violent conflict, to the household food insecurity rooted in poverty, to the vulnerability resulting from dietary traditions that mesh imperfectly with variations in need over the life cycle, to iodine deficiencies primarily attributable to the combination of poor soil and market isolation.

Hunger that actually threatens life, although affecting millions each year, is only the dramatic and highly visible tip of the iceberg. Despite the diversity of impacts of specific nutrient deficiencies, all operate to reduce the quality of life and to impair functioning and development. The toll of hunger as a whole is vastly greater than its contribution to mortality alone.

Reflected in most indicators, we see a problem that is at its most extreme in sub-Saharan Africa and South Asia. Wealthy societies, and those that stress equity, have less hunger than others. Yet hunger is present to some degree in every population for which meaningful data permit the question to be addressed. Sets of people affected by these varying kinds of hunger are overlapping but not identical. For instance, many of the underweight children undoubtedly live in food-poor households and may suffer from one or more specific micronutrient deficiencies, whereas other individuals may be affected by only one of the aspects of hunger considered. Because of this partial overlap, the numbers of people affected by each specific problem cannot be summed across problems to estimate the overall magnitude of world hunger. On the other hand, interventions directed at one specific problem will often have spillover effects for others.

It seems unlikely that so complex a problem would have any simple solution. Nonetheless, we do now have a good deal of knowledge of approaches that seem to be useful in addressing one or another aspect of the complex whole. The task that lies ahead is the assembly of a coherent and integrated policy package drawing on this experience to reduce the toll of hunger in the 1990s.

[31]Basil S. Hetzel, *The Prevention and Control of Iron Deficiency Disorders*, ACC/SCN State-of-the-Art Series, Nutrition Policy Discussion Paper No 3, Administrative Committee on Coordination/Subcommittee on Nutrition, United Nations, Geneva, Switzerland, 1988, p 50.