

Special Feature

CHANGING CONCEPTS OF HEALTH AND HEALTH SERVICES: NEW OPPORTUNITIES FOR NUTRITION PROMOTION^{1,2}

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Current evidence points to a distinct misallocation of health manpower and resources in the world's traditional and transitional societies. It thus appears that many societies could benefit markedly from profound changes in their health policies, objectives, structures, investments, and technologies. It also appears that appropriately conceived and operated nutrition programs could help considerably over the short run in reducing the high prevailing rates and adverse consequences of malnutrition.

Throughout this century—especially in the last 40 years—health as a concept evolved from an individual concern to a social responsibility. These new ideas evolved once the ravages induced by infectious diseases diminished as a result of the discovery of their causes, determinants, and personal reactions. By the middle of the 19th century, the refinement of the scientific method had catalyzed the development of microbiology, immunology, and epidemiology as distinct sciences; this process continues today. The identification of new microorganisms, the production of effective immunizing agents, and the discovery of human carriers, animal reservoirs, and vectors helped dispel people's beliefs, myths, and superstitions. However, these have remained entrenched in the minds of some and still shape their behavior. For them disease reflects their religious credence of supernatural causes: “divine retribution for sins of mankind, the

unpredictable whims of spirits, or the movements of the stars and planets” (1). Education has been, and still is, the most effective instrument to set right these misconceptions.

Changing Concepts of Health

During the course of this century, life expectancy slowly and steadily increased, changing the concept of health for both individuals and society. This has been mainly the consequence of the reduction of infant and early childhood mortality and the control of major infectious diseases. The fear of dying has been replaced by the dedication to survival, health, and productivity. Science and technology have contributed in no small way to creating this pattern of thinking.

Health today is considered an end for each individual and a means for the society to which he belongs. It is an end because it reflects the normal physiologic coordinated functions of body and mind—homeostasis—a condition relatively constant but which may vary as human beings adapt to internal and external stimuli (2-4). Lawrence Henderson recognized adaptability as a basic biological phenomenon. In his words, “adaptation is

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²The text presented here is derived from material contained in the WHO mimeographed document NUT/EL/WP/80.5, World Health Organization, Geneva, 1980.

relative, it involves a question, not of what is best, but of what is efficient under certain conditions, of what promotes survival in a particular environment, or of the disabilities resulting from a given lesion" (5).

The relation between nutritional requirements and homeostatic mechanisms is significant. Beyond a certain threshold, the latter cannot prevent impairments resulting from undernutrition. However, the establishment of this threshold involves a complex process (6). The concept of adaptation continues to be fundamental to the understanding of the performance of living beings (man included) in nature. "Adaptability is by definition an asset for survival," writes Rene Dubos; "but paradoxically, it constitutes in certain cases a heavy handicap against cultural and economic growth. The biological phenomena of adaptation present, therefore, problems that are of immediate relevance not only to health but also to social development" (7). This statement is best exemplified by man's adapting to nutritional scarcity and the physiologic and social mechanisms it entails as well as the pathologic consequences it determines.

In addition to being an end for each person, health is also considered a means for society, since it is through people's collective efforts that production, productivity, economic growth, and well-being are fostered and development occurs. We do not live for the sole aim of being healthy but also to contribute to the satisfaction of our own needs and those of our society. As it has been so aptly stated: "there can be no productivity or production in a population which is frequently ill, or health in a static economy" (8). Although man is the means for development, he is at the same time its end and purpose.

These ideas seem embodied in the WHO definition of health: "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (9). For some, this conceptualization is idealistic because it is subjective and refers to a situation that may exist in some individuals at a

certain time but not all the time; however, it is not usually observed in groups of human beings or in communities. Furthermore, health is considered a continuous, dynamic, and multicausal process, subject, therefore, to constant subtle variations, and not a state implying a static condition (10). This process is halted only by the onset of diseases of varying etiology that reflect a failure to adapt to the inner and outer environments. However ideal WHO's definition may be, it symbolizes the aspirations of human beings and represents an overall objective of societies and their governments.

Our main and perennial problem is how to translate the ideal into practical reality, particularly when we know that human aspirations have not and will not remain constant. According to John Bryant: "the guidelines for change can be stated simply—to ease the suffering and improve the health of all people as much as resources will allow. But we know the simplicity of the statement is deceptive. Trying to reach all the people of a population, rather than a few, places extreme pressure on every aspect of the health system—description of problems, planning, resource allocation, evaluation of results. At every turn, the same denominator is there—all the people" (11).

The efforts of a long overdue decolonization, of industrialization, and of urbanization throughout this century and mainly after World War II, have brought about a substantial change in the concept of health. In an increasing number of societies health is no longer accepted as charity or the privilege of the few, but demanded as a right for all. However, when attempts are made to interpret this principle and to design operational measures, the imbalance between what is needed and what is feasible becomes apparent. Resources are certainly way below requirements in every sector of many societies—a trait of underdevelopment. Health is no exception. Under these circumstances, the aspirations of the people should be satisfied by giving them equal right to available health care services—a

goal still to be reached in many developing countries. It is to be hoped that the largest allocation of resources will go to those problem areas that affect the greatest number of people and which can be solved or reduced by applying well-proven techniques at minimum cost. This objective is the province of rational planning and operational research. Even more important, decision-makers, health workers, and community members should think and act not only in terms of disease but of health (i.e., prevention and cure of prevailing conditions) as well.

The recognition of health as a right has strengthened the acceptance of its role as a determinant of development. In the last two decades, economic theory has undergone profound modification. At one time, it was virtually an article of faith that social progress should be the result of economic growth and reinvestment of savings. If these did not occur at an adequate level, the possibilities of reducing the toll of social ills were considered limited or nonexistent. According to this way of thinking, the role of human beings in the development process, both as producers and consumers, was grossly underestimated. Moreover, this theory lacked scientific rationale and was both inhuman and politically blind. Gunnar Myrdal, among others, has outlined in clear terms the past as well as the present course of action. "When economists in the postwar era, actually more than in earlier times, kept rather exclusively the so-called economic factors in their analysis of underdevelopment and development, this is simply a logical fault, as the changes of economic factors are causally interrelated with what happens to all the other factors in the social system. This defect of their analysis became particularly flagrant when consumption levels, so important to the soundness of body and mind and thereby also to economic productivity, were left out of the growth models applied in planning for development." Focusing on one factor, he adds: "Improved nutrition, for instance, will tend to raise productivity of labor,

while then higher productivity normally will increase the opportunity to improve nutrition" (12).

Health care programs can be evaluated in terms of the better ability of members of society to produce, invest, and consume. On the basis of the same reasoning, said programs facilitate exploitation of natural resources and contribute to a better environment.

It is being postulated that the returns from health, education, nutrition, and other social services—all investments in human beings—contribute directly to economic growth, for they are components of the development process and entitled to a share of the national income. The concept of human capital has been reintroduced to explain the differences between total national input and estimated output as reflected in economic growth. The investment multiplier effect of specific programs can be significant (13-16).

In a more direct way—albeit deeply rooted in moral values—Shaffer argues that "...we have come to accept as axioms that health is preferable to illness, knowledge preferable to ignorance, freedom (whatever the term may mean) preferable to slavery, peace preferable to war. Governmental expenditures directed towards the realization of these preferences bear no necessary relation to their economic profitability as investments" (17).

The debate of the last two decades has indeed contributed to the shaping of lending policies of international banks and capital-exporting governments. Programs having health and nutrition objectives can be regarded as investments in their own right because they reduce mortality and morbidity, and induce higher life expectancy and productivity. Such programs are significant for development, regardless of their undeniable, direct impact on economic returns. It has been decided that loans and grants should converge on poverty—the source of all social ills and moral decay. The absolute poor—roughly 40 per cent of the people of the developing countries—should be given priority in policies and

programs. The goal, in the words of Robert McNamara, should be "to eradicate absolute poverty by the end of the century. That means in practice the elimination of malnutrition and illiteracy, the reduction of infant mortality, and the raising of life expectancy standards to those of the developed nations. Essential to the accomplishment of this objective is an increase in the productivity of small-scale agriculture" (18).

This goal should be part of the social agenda for all developing societies of the last two decades of this century. It should be translated into integrated rural development projects. The same principles apply to the urban poor, those migrating to the periphery of large cities where they eke out an existence in shantytowns (19).

For the formulation of policies and the implementation of programs, national resources—human, financial, and material—are more important than external capital investments. They reflect sustained political will that is fundamental for identifying communities in extreme poverty, setting realistic goals and achieving them.

Conceptually, nowadays, the health of individuals and societies alike is considered the result of the interactions of heredity, environment, behavior, and health services (20). It is an ecologic interpretation of a process of adaptation of human beings to a changing inner and outer milieu. "It has been rightly said that we are what our genetic inheritance makes us and our environment allows us to be. In this context, health is a manifestation of both the innate and acquired adaptive capacity of each person" (21). The concept of etiology, of the specific cause, has been replaced by the "web of causation" and the "web of effects," both reflecting the complexities of an anthropocentric natural system. In the words of Reuel Stallones, "Certainly we cannot, and should not, ignore the usefulness of knowledge of specific etiologic factors. However, rather than devote all our effort to unraveling etiologic threads from the tangled ecologic skein,

we should concern ourselves with clusters of causes and combinations of effects and how they relate to each other" (22). As we have advanced in this conceptualization it has become possible to differentiate in the environment determinants of health and disease of an animate, inanimate, and behavioral nature. All of them interact with human beings. Great advances have been made regarding the first two determinants but progress has been limited with the third, the province of the sociocultural sciences (23). Still, the cognitive structure of a person in relation to health and nutrition is built upon knowledge, beliefs, mores, and superstitions—factors that shape behavior which, in turn, may govern the positive and the negative effects of health care. In some, it may even induce health or death.

Changing Concepts and Practices of Health Care Services

As noted, one important cluster of determinants of health and disease stems from the health services which have also changed both in concept and in practice, particularly after World War II. Historically, their main purpose has been the care and the cure of the sick. We should keep in mind that there seems to be evidence that better housing and nutrition—particularly through agricultural production and food distribution—were the main factors reducing death rates, especially those due to infectious diseases, long before the advent of scientific medicine in Western countries at the middle of the last century (24-26). To these same socioeconomic factors, plus improved water supplies, sewage disposal, and refrigeration, is ascribed the decline in infant mortality in the United States and Britain after 1900 (27). Better education and improved hygienic habits have certainly contributed, perhaps more than medical practices, to explain differences in morbidity and mortality rates among population groups during the evolution of today's industrialized countries.

For those iconoclasts who claim that med-

ical technology is, as a rule, iatrogenic not only clinically but also socially and structurally (28-30). Colin McCord (31) feels it can be proven that in traditional and transitional societies technologies for disease prevention and treatment have been effective to modify the trends of morbidity and mortality beyond the effects of development. Thus, to improve the quality of life—reducing first the toll of death and disease—there is a need for introducing specific social objectives into plans and programs, including those for health and nutrition, on the basis of the prevailing ills in a community.

A great imbalance between supply and demand of health care services is evident throughout the developing world. It varies within and between countries. The health care system, understood as the series of coordinated institutions (both private and public) dealing with the prevention and cure of disease, has a limited coverage. The poorest strata in society have very limited access, or none at all, to any service. Moreover, economic and social development programs simply do not reach them. As a result, demands for health care are not satisfied for a number of people either because local resources are lacking, are inaccessible, are understaffed, or lack prestige in the community. There is also a cultural constraint imposed by the beliefs, superstitions, and traditions of the villagers regarding the meaning of health and life. Programs are mainly implemented in the capital and more populated cities of each country, producing an uneven and inequitable placement of services.

This misallocation of physical resources for health care is related to a very skewed distribution of human resources. University graduates, technical workers, and auxiliary personnel are concentrated in the large cities in services and teaching, and do not always devote their efforts to the more prevalent problems. Besides this irregular distribution, there is also a functional misallocation of physicians resulting from their formal educa-

tional process which has been frequently criticized as being disease- and not health-oriented. As a consequence, emphasis is placed on treatment and not on prevention, on individual rather than on community care. Furthermore, health problems with a high incidence are not always analyzed in depth and with an ecologic approach covering all the biologic and socioeconomic causes and consequences as a basis for remedial actions. Malnutrition is a case in point. Attracted by market opportunities in both the private and the public sectors, graduates specialize early in their careers. Naturally, market opportunities are greater where the population is larger. A similar situation affects other university graduates and technical members of the health team.

Although the importance of medical care is recognized, it has been relied on too heavily for curbing morbidity and mortality trends in traditional and transitional societies. Diseases are to a large extent environmental in origin and preventable by increasing the resistance of individuals and reducing the deleterious effects of agents operating in their surroundings. We agree with Dubos when he states that "the extent of health improvement that ensues from building ultramodern hospitals with up-to-date equipment, is probably trivial in comparison with the results that can be achieved at much lower cost by providing all infants and children with well-balanced food, sanitary conditions, and a stimulating environment. Needless to say, acceptance of this thesis would imply profound changes in medicosocial policies and would affect also the selection of problems in scientific research" (32). Wherever hospitals may be needed, functional efficiency (not excessive splendor) should be the prevailing principle.

Health care, being a basic need, was conceived as a service to be provided, even imposed by the central authorities, to those entrenched in their traditions. We are at a period of ongoing change from paternalism to community participation. In our interpreta-

tion, this does not mean that people are disregarding government responsibility for their well-being; quite the contrary, they want to participate in making their government's decisions and implementing them. To a certain extent, paternalism impairs human dignity. It tends to assume that citizens expect everything from the state and are unwilling to devote their efforts to the common good.

It has repeatedly been shown, in urban and rural environments alike, that whenever there has been genuine motivation to increase community well-being, the people's response has exceeded all expectations (33). What is essential is to listen to the problems they consider most pressing and the solutions they propose; to make joint decisions, and to assign responsibility to community members for specific actions to be performed—including financing wherever possible. In turn, the people have the right to services that should be accessible, effective, and efficient. In planning and guiding the system the providers will take the wishes of the people into account.

In sum, it has become absolutely necessary to catalyze this vast potential source of cooperation in carrying out activities for disease prevention and cure throughout the world. As in all human endeavors, coordinating supply and demand of health care to satisfy people's desires faces no small number of constraints. "Some consider consumer involvement as a necessary evil, others have welcomed it as an educational opportunity for both the provider and consumer. Still others have remained as neutral as possible" (34). It is to be expected that community members should become active participants in the development process and not remain passive spectators just reaping the benefits, if any, of the system.

It is not possible to recommend a standard pattern of community participation in view of the wide range of economic and social problems as well as political and cultural traits that exist in the various countries or within a single one (35). For the same reason, priorities and actions to prevent and cure common diseases

may differ greatly in accordance with the characteristics of each community. Nevertheless, the people certainly know what social ills affect them.

The Primary Health Care Renaissance

Regional governments have, in the past, made recommendations on the significance of increasing the coverage of the health system to reach the smaller human aggregates (36). A series of circumstances have justified the renaissance of the primary health care movement in the world. "Health for All by the Year 2000" is the theme that symbolizes the determination of the countries of the world to provide an acceptable level of health to all people "as an integral part of social development in the spirit of social justice" (37).

The contributing factors—the bases for actual or forthcoming changes in health services—include:

- A clearer realization of the situation of the poor, including their growth in numbers and increasing risk of death, hunger, disease, and disability.
- Trends toward social equity as exemplified by propositions for a "new economic order" and ideas of social justice that inspire governments' pronouncements but do not necessarily affect their decisions or actions.
- The "piecemeal" approach to social problems without due consideration of the cumulative and interactive effects of specific actions.
- Neglect, arising from limited social mobility and services coverage in rural areas, which has stimulated an unplanned migration to the cities, thereby inducing further problems.
- Lack of health services for a large proportion of the population, particularly those living under conditions of critical poverty. These human beings have recourse to empirical medicine through indigenous health workers. Although useful, their assistance could be rendered more effective as a result of

adequate training and supervision.

- The fact that active community participation in assessing problems and formulating and implementing programs (to reduce morbidity and mortality with emphasis on prevention) is still more the exception than the rule.

- The growing imbalance between basic needs and available resources has brought, as a response, global development and sectoral planning, both systematic and pragmatic. In the health field there exists much relevant experience in the world (38-48). However, in the less developed countries, economic and social planning, including health, has not yet become a true process—and it should.

- Active worldwide debate concerning the impact of population growth on family well-being—high levels of fertility usually reflect poor health and social conditions—has brought about recognition of the individual's right to decide the number and timing of births. Despite sustained progress, much still has to be done (49-50) in order to make possible the actual exercise of this right (through family planning programs) for a vast majority of the world's population. Such programs must be a component of effective health care planning and implementation that takes into account demographic variables in terms of rates of growth, as well as population distribution, and the interaction of these with economic growth trends, investments in health services, and development of health resources. Yet, these factors are not always examined carefully in the health planning process.

- Deficient organization and administration of national and local institutions is one of the major obstacles to providing the means for the prevention and treatment of disease. Rigid structures, faulty management, discontinuous decisions, and insufficient financing must be reformed if objectives are to be attained and disease prevented. Waste, duplication, mismanagement, and other administrative ills must be curtailed. With the same investments made at present, a significantly greater return in health care can be obtained. Extensive cov-

erage, however, will become feasible only when larger health budgets are adopted.

- This century has witnessed an exponential growth of scientific information on the diagnosis, treatment, and prevention of disease. It has brought about an increasingly complex medical technology. And yet, morbidity and mortality rates are still too high in the developing as compared with the industrialized countries. There is sufficient knowledge, carefully tested, that warrants extensive application. But there are still substantial unknowns that warrant further experimentation so that rational decisions in health care may be based on facts. Perhaps more significant, the dissemination of scientific knowledge has led to imitation and the adoption of methods and instruments for problems that have usually no high priority in underdeveloped nations. They may be useful for the few but not for the many. An important component of primary health care is appropriate technology that "must address the area of greatest need, must promote self-reliance on the part of those for whom it is designed, and must be environmentally sound" (51). We may add that it must also be appropriate to the local value systems and existing resources to ensure continued use. However, despite the urgency to design and apply appropriate technology, research lags behind (52).

- Spread of political, social, and general information within and between countries through the mass media has had, and is having, an impact on the minds of people, increasing or distorting their knowledge, raising their hopes or frustrations, and changing their behavior. All of this may have a favorable or adverse effect on health care and nutrition.

As the report of the Alma-Ata Conference on Primary Health Care (1978) noted: "Primary health care should include at least: education concerning prevailing health problems and the methods of identifying, preventing, and controlling them; promotion of food supply and proper nutrition, an adequate supply of safe water, and basic sanitation; maternal

and child health care, including family planning; immunization against the major infectious diseases; prevention and control of locally endemic diseases; appropriate treatment of common diseases and injuries; promotion of mental health; and provision of essential drugs" (53). This is certainly a large order of responsibility for the governments, the people, and the health staff, including the traditional workers. However, the dimensions of each problem, the experience and the resources to deal with them, the order of priorities, and the will of the inhabitants to assume the tasks, benefits, and contributions, will vary among communities; hence the need for rational programming with their active and informed participation.

Should primary health care become the central focus in a society, the whole health care system must be reorganized accordingly. Nevertheless, to emphasize exclusively the social periphery—human beings in rural areas and shantytowns—is to forget that a rational health system must include primary, secondary, and tertiary care—three interdependent phases of increasing technical complexities in one process. We realize that this is more easily said than done, particularly where geography, climate, economic infrastructure, funds, the effectiveness of each subsequent level, and other factors are the main constraints to an adequate referral model of health care delivery. Still, it must be done, else we risk perpetuating categories of care according to location and income, whereby the disadvantaged will receive, perhaps forever, only primary services which may not always be adequate and efficient.

Technical knowledge without political will is of little use. Yet the latter, and its resultant decision-making process, is not the privilege only of certain political structures, as the history of public health shows. We will certainly agree that "health problems in the developing world are not simple and to constantly pass them off as being well understood will do little to attract the kind of attention they deserve

and the kinds of skill and dedication needed to solve them. They are immensely complex and require high prestige and priority if they are to command the appropriate attention of socio-medical sciences" (54). Still, there is plenty of knowledge and technology that awaits application by the people, their trained healers, auxiliary health workers residing in the community, and supervisory professionals who visit a community as often as weather, roads, transportation, and other factors permit. Even though an intersectoral approach should guarantee in principle longer effects for the solution of health problems, we are still far from understanding the links and mutual dependence of the biologic, environmental, economic, and social factors involved; more research is needed.

All available information points to a distinct misallocation of manpower, functions, and physical resources for health in the traditional and transitional societies of the world. We believe that a similar situation exists with reference to other social services, particularly those involved with nutrition.

Changes in Nutritional Concepts

According to Howard Schneider, basic studies on nutrition go back to 400 B.C. They continued up to 1750 A.D. in what he calls the naturalistic era, during which food was recognized empirically as important for human beings in health and disease. It was followed during the 18th and 19th centuries by the chemico-analytical era, which was influenced by the ideas of Lavoisier and Liebig and concentrated on the study of the chemical nature of foods. However, despite the chemists' great ability and the thoroughness of their analyses, their predictions with regard to the nutritional value of certain compounds failed disastrously in the feeding of farm animals. "Like the physicists, the nutritionists found themselves being forced to contemplate a new world of smaller dimensions than their analyses had prepared them for. It was the entry into this

new world of micronutrients that led, around 1900, into the modern era of nutrition, the biological era" (55).

The present century has seen the development of one of the most remarkable contributions to science with the identification of vitamins, trace elements, and of the structure and several of the specific metabolic functions of proteins, carbohydrates, and lipids. These investigations into nutrients at the cellular and subcellular levels, along with studies in genetics, immunology, and food science, created the potential for adaptive research in public health. Specific nutritional deficiencies have been identified and technologies to control them tested; however, these technologies have not yet been applied in all countries where the nutritional deficiencies are prevalent.

The fact remains that although we are certain of some of the metabolic efficiencies induced by vitamins and trace elements, we are far from fully understanding the totality of their action and interaction in human beings. The marvelous scientific adventure unraveled during the first half of the present century has not ended. The full role of micronutrients in the prevention of disease and the promotion of health is yet to be explained (56-57). Williams (58) expounds on the thesis that the nutritional microenvironment of our body cells is crucially important to our health, and that deficiencies in this environment constitute a major cause of disease.

For some, this research in nutrition is a good example of the trend in science up to World War II, namely, that it was essentially analytical and reductionist. It has not been able to explain the actual determinants of nutritional deficiencies nor the changes to diminish their consequences for man and society. The need for systems science has become apparent.

In the last 30 years there has been a rebirth of nutrition as a social problem. It has been triggered by publicized outbreaks of famine and the tragic visage of severe malnutrition and chronic hunger; by the recognition of the

right of every human being to a balanced diet; by the knowledge of the role nutrients play as supporters of health and, when lacking, as inducers of disease; and by the higher incidence of nutritional deficiencies and death rates among those living in critical poverty. Despite the different cultural faces it shows, the latter is considered the root of all malnutrition.

It has been said that the concept of nutrition is vague, imprecise, and difficult to bring into focus, since it does not belong to any particular sector of development. Consequently, priority in national budgets is given to food, understood as production, rather than to nutrition, in the sense of consumption. "For governments to be concerned with food as a commodity," writes Alan Berg, "but not with nutrition—which is food analyzed into its nutritional constituents, as it reaches and affects people—reflects a double vision. Yet economic distinction commonly is made between food and nutrition—ranking food 'high,' nutrition 'low'; or food 'essential,' nutrition 'welfare.' Food has obvious tangibility features that nutrition lacks. Food costs and supplies can be measured, subjected to economic analysis, and entered into the national accounts. Nutrition in contrast often is invisible and dimly understood, and it seldom commands a price, especially among those who need it most" (59). This type of thinking, which has long prevailed in the developing world, accounts for the scant attention given in general development and sectoral policies to the adverse effects of poor nutrition.

Through system analysis, the determinants of chronic undernutrition have been identified, namely those relating to the production, consumption, and utilization of food. From such an examination, malnutrition, being of a multisectoral and multidisciplinary nature, emerges as a problem of overall development. It includes a large series of interrelated variables that should be quantified, if possible, in order to formulate a food and nutrition policy and translate it into a plan with specific programs and projects. Among the latter are

those for the promotion and restoration of health, and the prevention of disease.

In order to understand the dynamics of malnutrition, it is essential to examine causes as well as to look at symptoms. The former, rooted as they are in privation, are a reflection of the prevailing political systems and the decisions that lie behind economic and social strategies, including those for agriculture, health, population, and education. The control and prevention of malnutrition should take into account, simultaneously or successively, the processes and resources that relate (at the macro level) to the production and availability of food and (at the micro level) to its consumption and utilization. It is the government that bears the fundamental responsibility in all phases, from diagnosing the problem and assessing its scope to executing programs related to any approach selected. It is in this context that differences of opinion arise among those who interpret the current situation and foresee the future of chronic undernutrition in a given country or region and who suggest approaches for a progressive solution. There is agreement, nevertheless, as to the fact that there are no panaceas.

The proponents of direct nutrition interventions find their greatest justification in the historical experience of economic and social development trends projected into the future. Neither increase in employment and family income (60-62) nor sustained agriculture production (63-65) will improve diets and reduce chronic undernutrition and its attendant mortality, morbidity, and poor performance in a reasonable period of time. In some countries it may take one or more generations. Furthermore, the formulation of fiscal and monetary policies, as well as those related, for example, to taxes, credit, and foreign trade, fail to take into account their potential adverse effects on the incidence of nutritional deficiencies.

To sum up, economic and social development is not giving genuine priority, as it should, to the alleviation of poverty. Reutlinger and Selowsky have come to the conclu-

sion that "malnutrition is unlikely to disappear in the normal course of development: that is, in the course of normal per capita income growth, even with greater emphasis on expansion of food production—barring, of course, unusual technological breakthroughs. On the contrary, the situation may worsen if present higher energy cost, leading to higher cost of food production, is not fully compensated by higher agricultural productivity" (66).

At present, the coverage of programs aimed at the social sectors—health, education, population, food subsidies, housing—is neither sufficient nor efficient. The supply of services falls short of the demonstrated demand. Scarce resources are not being assigned to the most pervasive problems, nor are they benefiting those who are most greatly in need. Seldom is there an integrated approach based on the synergistic nature of social ills.

New Opportunities to Promote Nutrition

Concurrent with their economic development activities, many societies need to institute profound changes in policies, objectives, structures, investments, and technologies for guaranteeing adequate food intake and biologic utilization for all their people. During the period when such changes are occurring, direct and indirect nutrition programs offer an efficient means of reducing the rate of malnutrition and its consequences in the short run. The question is, then, whether new opportunities exist for promoting nutrition through modern health care policies and programs. For the following reasons we believe there are significant opportunities at this time:

- Despite doubts as to the real number of malnourished human beings in the world (because of the disparity of various survey results), the global problem is still of enormous dimensions (67-68).
- Today, governments and international organizations are recognizing the significance

of nutrition for development and are identifying determinants and symptoms, conducting critical analyses of past experiences, and deciding on solutions that are both effective and economically viable (69-71).

- It is also recognized that different and complex constraints may interfere with the implementation of plans and programs (72). However, there is a consistent movement by an increasing number of governments to improve the nutritional status of their people.

- It can be safely stated that the problem remains, or is even growing, in the poverty-stricken countries of the world. This is so because programs are not being directed to the vulnerable groups (mainly poor mothers and children) in the rural areas, urban slums, and shantytowns, or if they are, actions reach too few people and are fragmented. Measures proposed often do not fit local conditions, dietary practices, financial possibilities, and cultural traits. Nutrition objectives are either absent or have low priority in the health system, and no well-tested methodology is available to introduce them in primary health care for a large number of human beings. The role of community leaders—paramount for an effective implementation of programs—is not clearly defined. As a general rule, nutritional considerations are not usually included in development policies, and agriculture production is not consistently guided toward the improvement of the people's nutritional status. Cash crops frequently prevail over food crops, and imports are not enough to satisfy the consumption needs of all.

- Recent advances have been made leading to a better understanding of the food and nutrition planning process in terms of concepts, purposes, methodologies, and limitations. As in the health field, and in all sectors of social development, nutrition planning becomes a mechanism for reaching specific objectives by means of defined actions which will reduce the numbers both of the severely malnourished and those at great risk of becoming malnourished (73-75).

- As there is a synergism of adverse effect between ill health and malnutrition, there appears to be a synergism among programs to reduce both disease and undernutrition (76-77). A series of studies conducted in populations of less than 120,000 show that the combined effects of health, nutrition, sanitation, education, and family planning do in fact result in increased physical growth, and that there is a one-third to one-half reduction in infant and child mortality over a period of one to five years (78-79). Although these outcomes are indeed encouraging, we need to see their large-scale application by governments and the people of the poverty-stricken areas of the world. It is worth noting that, from a conceptual point of view, these actions fall within the modern approach to health care.

- In the 1970s, new insights stemming from research have enlarged the opportunities for promoting nutrition through the health care system and, even better, through an integrated approach of social development in rural and urban areas targeted to families living under conditions of critical poverty. Some come readily to mind:

- a) The revival of breast-feeding, whose decline over the past 50 years in urbanized communities has been associated with the high prevalence of infant and early childhood malnutrition in lower income families. Recent studies show that natural lactation fits the nutritional and physiological requirements of babies; provides them with antibodies, enzymes, and other factors for resisting infections and allergies; and induces the development of the immune system. Breast-feeding has also some contraceptive effects. These, among other significant benefits for mother and baby, warrant the world-wide educational effort to restore breast-feeding to its dominant place in infant nutrition (80-82).

- b) Maternal malnutrition (both historically and during childbearing), has critical consequences for the child, as reflected in the high incidence of low-birth weight, immaturity, impaired psychomotor performance, and death. There are already abundant grounds to initiate or expand maternal food supplementation programs as part of primary health care services (83-84).

- c) The concept and practices of weaning are now

better understood. As a result, preferences should be given to the homemade preparation of foods that are based on staples consumed by the family that should be safe, easily digested by the child, and with an adequate nutritional value. This involves education and demonstration by community health workers and is one of the most significant responsibilities of the primary health care system. "Low-income populations are well schooled in the science of survival," writes Austin, "and many traditional food mixtures and processing techniques have served them fairly well... Planners would be well advised to begin with the traditional foods that fit the social context, calling upon their armamentarium of technology only to improve what already exists" (85).

d) In an essay on the evaluation of food supplementation programs for small children in developing countries, it is concluded that such programs are expensive in terms of the indicators of physical growth and development that were studied. And yet, they did not measure, in the authors' judgment, other positive effects—increased activity, cognitive or metabolic responses—in addition to the overall benefit for the family and the community. It would seem wise to evaluate these results by suitable indicators before eliminating such programs (86).

e) Malnutrition has an adverse effect on intellectual development (87), school performance (88), and labor productivity (89)—all of which have bearing on production and well-being. Breast-feeding and adequate weaning, concurrent with psychosocial stimulation, will prevent these deleterious consequences in children. Food supplementation will increase work output in adults. Still, research has not elicited the functional implications of marginal nutrient deficiencies. When properly documented, these negative effects of chronic undernutrition should be included in a dialogue among planners, economists, and health and nutrition specialists leading to specific programs with measurable objectives whose target group is the poor.

f) Nutrition education is most important in implementing programs that stem from a food and nutrition policy. Since its objective is to expand knowledge, create awareness, change behavior, and improve nutritional status, nutrition education will be more effective if it is developed at the community level—a face-to-face process—with the informed and active participation of motivated people. This also is a responsibility of the primary health care system. There are those who claim that nutrition education has at best a limited role in preventing protein-calorie malnutrition in developing countries and is far from being the required

solution of the problem (90). And yet, the weight of the rationale of nutrition education, despite the weakness of the evidence, is such that for some it may turn out to be the most cost-effective intervention, particularly when mothers apply to their own children and transmit to their neighbors new knowledge related to sound nutritional practices. Messages should be culturally-based and refer to foods preferably produced by them or that are locally available and affordable and fit with the people's eating habits. Harmful beliefs about food and disease should be taken into account and the language used must be clearly understood even when no vernacular is involved.

g) Successes in food fortification programs point to the urgent need for extending them to countries where similar nutrition deficiencies are prevalent (91-95). This is another function of a rational health care system.

h) Diarrheal diseases continue to be one of the leading causes of death of children under five in developing countries. There is now sufficient experience to prevent, control, and manage them at the community level with measures which include oral rehydration and adequate feeding (96-97).

i) Modern concepts of education for primary health care workers as they apply to nutrition have been defined, detailed in specific tasks for problem-solving, and tested. The resulting guidelines should become a useful tool for incorporating nutrition objectives into primary health care and implementing them subsequently (98).

j) There are available simplified methodologies for field surveys of nutritional status involving few key measurements to be performed by trained paraprofessional personnel. Such surveys should be a regular function of primary health care for nutrition promotion, and they should be combined with the organization of a surveillance system (99).

It has been stated that "efforts of the health sector in combating malnutrition have been either fruitless or very insufficient" (100). And yet, the last 10 years have brought about a better understanding as well as sound experience on the extended role of health care to improve the nutritional status of the people and to reduce the incidence and consequences of malnutrition in the context of a rational food and nutrition policy. The need for redefining the responsibilities of the health sector and redirecting its work is therefore amply justified.

REFERENCES

- (1) Snyder, J. C. Public Health and Preventive Medicine. In: J. Z. Bowers and E. F. Purcell (eds.). *Advances in American Medicine: Essays at the Bicentennial*. Josiah Macy, Jr. Foundation, New York, 1976, Vol. I, p. 384.
- (2) Bernard, C. Les Trois Formes de la Vie. In: *Leçons sur les phénomènes de la vie communs aux animaux et aux végétaux*, I, 67, Paris, 1878.
- (3) Richet, cited by W. B. Cannon. Organization for physiological homeostasis. *Physiol Rev* IX (3):399, 1929.
- (4) Cannon, W. B. *The Wisdom of the Body*. W. W. Norton & Company, Inc., New York, 1939, p. 24.
- (5) Henderson, L. J. *Blood: A Study in General Physiology*. Yale University Press, New Haven, 1928, p. 17.
- (6) Waterlow, J. C. The Concept of "Normal" in Nutrition. In: Pan American Health Organization, *Metabolic Adaptation and Nutrition*. Scientific Publication No. 222. Washington, D. C., 1971, p. 76.
- (7) Dubos, R. *Man and His Environment - Biomedical Knowledge and Social Action*. PAHO Scientific Publication 131. Pan American Health Organization, Washington, D. C., 1966, p. 13.
- (8) Pan American Health Organization. *Ten-Year Health Plan for the Americas*. PAHO Official Publication 118. Washington, D. C., 1973, p. 4.
- (9) World Health Organization. *Constitution of the World Health Organization (twenty-third edition)*. Geneva, 1972.
- (10) Bersh, D. Hacia una base filosófica de la salud. Thesis (part I). Colombia, 1975.
- (11) Bryant, J. How Countries Are Meeting Their Health Problems. In *Health and the Developing World*. Cornell University Press, Ithaca, 1969, p. 92.
- (12) Myrdal, G. Poverty in Human Survival. (Concluding address delivered at the International Health Conference sponsored by the National Council for International Health.) Reston, Virginia, 1974, pp. 4-5.
- (13) Andreano, R. L., and R. E. Baldwin. The Economic and Cultural Impacts of Disease: A Survey of the Literature. In: B. A. Weisbrod, et al. *Disease and Economic Development*. The University of Wisconsin Press, Madison, 1973, p. 16.
- (14) Schultz, T. W. Investment in human capital. *Am Econ Rev* 51:1, 1961.
- (15) Mushkin, S. J. Health as an investment. *J Polit Econ (Suppl.)*, October 1962, pp. 129-157.
- (16) Barg, B. Nutrition and National Development. In: A. Berg, N. S. Scrimshaw, and D. L. Call (eds.). *Nutrition, National Development, and Planning*. MIT Press, Cambridge, 1973, p. 52.
- (17) Shaffer, H. G. Investment in human capital: Comment. *Am Econ Rev* 51:1033-1034, 1961.
- (18) McNamara, R. S. Address to the Board of Governors of the International Bank for Reconstruction and Development. Nairobi, Kenya, September 1973, p. 27.
- (19) McNamara, R. S. Address to the Board of Governors of the International Bank for Reconstruction and Development. Washington, D. C., September 1975.
- (20) Blum, H. L. *Planning for Health: Development and Application of Social Change Theory*. Human Science Press, New York, 1974.
- (21) Pan American Health Organization. *Ten-Year Health Plan for the Americas*. PAHO Official Publication 118. Washington, D. C., 1973, p. 4.
- (22) Stallones, R. A. *Environment, Ecology, and Epidemiology*. PAHO Scientific Publication 231. Pan American Health Organization, Washington, D. C., 1971, p. 14.
- (23) Pan American Health Organization. *Environmental Determinants of Community Well-Being*. PAHO Scientific Publication 123. Washington, D. C., 1965.
- (24) Winkelstein, W. Epidemiological considerations underlying the allocation of health and disease care resources. *Int J Epidemiol* 1:69-74, 1972.
- (25) McKeown, T., and C. R. Lowe. *An Introduction to Social Medicine* (2nd ed). Blackwell, Oxford, 1974.
- (26) McKeown, T., and R. G. Brown. Medical evidence related to English population changes in the eighteenth century. *Population Studies* 9:119-141, 1955.
- (27) McDermott, W. Modern medicine and the demographic-disease pattern of overly traditional societies: A technological misfit. *J Med Educ* 41 (part 2):137-174, 1976.
- (28) Illich, I. *Medical Nemesis*. Pantheon, New York, 1976.
- (29) Carlson, R. J. *The End of Medicine*. John Wiley and Sons, New York, 1976.
- (30) McKeown, T. *The Role of Medicine—Dream, Mirage or Nemesis*. Rock Carling Monograph. Nuffield Provincial Hospitals Trust, London, 1976.
- (31) McCord, C. Medical Technology in Developing Countries: Useful, Useless, or Harmful? Paper presented at the Workshop on Effective Interventions to Reduce Infection in Malnourished Populations sponsored by the United States National Academy of Sciences. Port-au-Prince, Haiti, June 1977.

- (32) Dubos, R. *Man and His Environment: Biomedical Knowledge and Social Action*. PAHO Scientific Publication 131. Pan American Health Organization, Washington, D. C., 1966, p. 10.
- (33) World Health Organization. *Health by the People*. Geneva, 1975.
- (34) Haynes, M. A. Workshop Topic: Role of Communities in Health Care. Paper presented at the International Health Conference sponsored by the National Council for International Health. Washington, D. C., April 1973, pp. 1-2.
- (35) Popkin, B. M. Community-Level Considerations in Nutrition Planning. Mimeographed document. Chapel Hill, North Carolina, 1979.
- (36) Pan American Health Organization. Health Service Systems and Their Coverage. In: *Ten-Year Health Plan for the Americas*. PAHO Official Publication 118. Washington, D. C., 1973, pp. 72-76.
- (37) World Health Organization. *Primary Health Care*. (Report of the International Conference on Primary Health Care held in Alma-Ata, USSR, on 6-12 September 1978.) Geneva, 1978, p. 17.
- (38) Hilleboe, H. E., A. Barkhuus, and W. C. Thomas, Jr. *Approaches to National Health Planning*. WHO Public Health Papers, No. 46. World Health Organization, Geneva, 1973.
- (39) Ahumada, J. et al. *Health Planning: Problems of Concept and Method*. PAHO Scientific Publication 111. Pan American Health Organization, Washington, D. C., 1965.
- (40) Feldstein, M. S. Health sector planning in developing countries. *Economica*, May 1970, pp. 139-163.
- (41) United Kingdom, Department of Health and Social Security. *The NHS Planning System*. June 1976.
- (42) Health Services Planning. King Edward's Hospital Fund for London, London, 1976.
- (43) Bogatyrev, I. D., and M. P. Rojzman. Public Health Planning in the USSR. In: H. E. Hilleboe, A. Barkhuus, and W. C. Thomas, Jr., *Approaches to National Health Planning*. World Health Organization, Public Health Papers No. 46. Geneva, 1973, pp. 29-44.
- (44) Regional Planning: The Swedish Approach. In: H. E. Hilleboe, et al., *Approaches to National Health Planning*. World Health Organization, Public Health Papers No. 46. Geneva, 1973, pp. 69-86.
- (45) Health Planning in the USA. In H. E. Hilleboe, et al., *Approaches to National Health Planning*. World Health Organization, Public Health Papers No. 46. Geneva, 1973, pp. 69-86.
- (46) World Health Organization. Working Guidelines for Country Health Programming.
- (47) Pan American Health Organization. *Ten-Year Health Plan for the Americas*. PAHO Official Publication 118. Washington, D. C., 1973.
- (48) Pan American Health Organization. *Basic Reference Document for the III Special Meeting of Ministers of Health of the Americas*. Washington, D. C., 1972.
- (49) International Statistical Institute. *The World Fertility Survey: Annual Report, 1977*. Voorburg, Netherlands.
- (50) McNamara, R. S. Address to the Massachusetts Institute of Technology. Cambridge, April 1977.
- (51) Holden, C. Pioneering rural technology in India. *Science* 207(4427):159, 1980.
- (52) Daza, C. H., and N. Rodríguez. Enfoque intersectorial de la salud y sus relaciones con la planificación alimentaria y nutricional. Paper presented at the International Conference on Food and Nutrition Planning sponsored by the Institute of Nutrition of Central America and Panama (INCAP). Antigua, Guatemala, April 1980.
- (53) World Health Organization. *Primary Health Care*. (Report of the International Conference on Primary Health Care held in Alma-Ata, USSR, on 6-12 September 1978.) Geneva, 1978, pp. 24-25.
- (54) England, R. More myths in international health planning. *Am J Public Health* 68(2):158, 1978.
- (55) Schneider, Howard A. What Has Happened to Nutrition? *Perspect Biol Med* 1(3):282, 1958.
- (56) Agricultural Research Council/Medical Research Council. *Food and Nutrition Research: Report of the ARC/MRC Committee*. Her Majesty's Stationery Office, London, 1974.
- (57) Schroeder, H. A. *The Trace Elements and Man*. Devin-Adair, 1973.
- (58) Williams, R. J. *Nutrition Against Disease - Environmental Prevention*. Pitman Publishing Corporation, 1971.
- (59) Berg, A. *The Nutrition Factor: Its Role in National Development*. Brookings Institution, Washington, D. C., 1974, p. 30.
- (60) Poleman, T. T. Food, Population, and Employment: Some Implications for Mexico's Development. Paper presented at the Symposium Alimentación: Reto de México. Querétaro, Mexico, 1978.
- (61) Johnston, B. Strategies for the Reduction of Malnutrition. In: L. Joy (ed.). *Nutrition—The State of the Art*. IPC Science and Technology Press, England, 1978, pp. 57-66.
- (62) Berg, A. Nutrition and Basic Needs. World Bank, Washington, D. C., 1978 (mimeographed).
- (63) Pinstrup-Andersen, P. Incorporating Nutritional Goals Into Agricultural Sector Planning. Paper presented at the XI International Congress of Nutrition. Rio de Janeiro, Brazil, 1978.
- (64) McNamara, R. S. Address to the Board of

Governors of the International Bank for Reconstruction and Development. Nairobi, Kenya, September 1973.

(65) Austin, J., et al. *Nutrition Intervention Assessment and Guidelines*. Harvard Institute for International Development, Cambridge, 1978, p. 269 (Table 2).

(66) Reutlinger, S., and M. Selowsky. *The Anatomy of Hunger: An Overview of "Malnutrition and Poverty; Magnitude and Policy Options."* The World Bank Occasional Papers, No. 23. World Bank, Washington, D. C.

(67) Poleman, T. T. *Quantifying the Nutrition Situation in Developing Countries*. Cornell Agricultural Economics Staff Paper No. 79-33. Cornell University, Ithaca, 1979.

(68) Srinivasan, T. N. *Malnutrition: Some Measurements and Policy Issues*. The World Bank Staff Working Paper No. 373. Washington, D. C., February 1980.

(69) United Nations Economic and Social Council. World Food Conference. Document E/5587, 22 November 1974.

(70) Subcommittee on Nutrition of the United Nations Administrative Committee on Coordination. Nutrition: The Response of External Agencies to the Requests of Governments.

(71) *Food and Nutrition Bulletin*. Possible actions by governments to improve human nutrition: Recommendations, submitted to the World Food Council by the ACC. *Food and Nutrition Bulletin* 1(2): 24-26, 1979.

(72) Horwitz, A. Increasing the capacity of the international agencies for policy formulation and programme or project preparation in nutrition. *Food and Nutrition Bulletin* 1(4):11-14, 1979.

(73) Lynch, L. E. Nutrition Planning Methodologies: A Comparative Review of Typology and Applications. (Document prepared for the Subcommittee on Nutrition of the United Nations Administrative Committee on Coordination.) 1978.

(74) Horwitz, A. The Food and Nutrition Planning Process in Developed and Developing Countries. Paper presented at the International Conference on Food and Nutrition Planning sponsored by the Institute of Nutrition of Central America and Panama (INCAP). Antigua, Guatemala, April 1980.

(75) Joy, L. Food and Nutrition Planning Theory: Current Conceptual and Methodological Advances. Paper presented at the International Conference on Food and Nutrition Planning sponsored by the Institute of Nutrition of Central America and Panama (INCAP). Antigua, Guatemala, April 1980.

(76) Scrimshaw, N. S., C. E. Taylor, and J. E. Gordon. *Interactions of Nutrition and Infection*. WHO

Monograph Series, No. 57. World Health Organization, Geneva, 1968.

(77) Latham, M. C. Nutrition and infection in national development. *Science* 188(4188):561-565, 1975.

(78) Gwatkin, D. R., J. R. Wilcox, and J. D. Wray. *Can Health and Nutrition Interventions Make a Difference?* Overseas Development Council Monograph No. 13. Overseas Development Council, Washington, D. C., 1980.

(79) Taylor, C. Sectoral Approaches to Food and Nutrition Policy Analysis: Nutrition and Health Sector Planning. In: L. Joy (ed.). *Nutrition Planning: The State of the Art*. IPC Science and Technology Press, England, 1978, pp. 28-35.

(80) World Health Organization. *Joint WHO/UNICEF Meeting on Infant and Young Child Feeding: Statement, Recommendations, List of Participants*. Geneva, 1979.

(81) Jelliffe, D. B., and P. E. F. Jelliffe. *Human Milk in the Modern World*. Oxford University Press, 1978.

(82) Nutrition Committee of the Canadian Paediatric Society and the Committee on Nutrition of the American Academy of Pediatrics. Breast-feeding, a commentary in celebration of the International Year of the Child, 1979. *Pediatrics* 62(4): 591-601, 1978.

(83) Thomson, A. M. Nutrition During Pregnancy: A Review. (Background paper prepared for the Second Session of the Consultative Group on Maternal and Young Child Nutrition.) Rome, Italy, November 1979.

(84) Lechtig, A., et al. Effects of maternal nutrition on infant health: Implications for action; An International Workshop; Panajachel, Guatemala. *Archivos Latinoam Nutr* 29 (Suppl. 1):12-16, 1979.

(85) Austin, J., et al. Nutrition Intervention Assessment and Guidelines. (Document submitted to the United Nations ACC Subcommittee on Nutrition.) June 1978, p. 167.

(86) Beaton, G. H., and H. Ghassemi. Supplementary Feeding Programmes for Young Children in Developing Countries. (Report prepared for UNICEF and the Subcommittee on Nutrition of the United Nations Administrative Committee on Coordination.) October 1979.

(87) Brozek, H. Nutrition, malnutrition, and behavior. *Ann Rev Psychol* 29:157-177, 1978.

(88) Pollitt, E., and N. Lewis. Nutrition and Educational Achievement. (ACC Subcommittee on Nutrition of the United Nations. Sixth Session, Paris, 25 Feb.-1 March 1980.) Document SCN/80 (1)-7. Paris, 1980.

(89) Popkin, B. Nutrition and labor productivity. *Soc Sci Med* 120:117-125, 1978.

(90) Béhar, M. Protein-calorie deficits in devel-

oping countries. In: N. H. Moss and J. Mayer (eds.). Food and nutrition in health and disease. *Ann NY Acad Sci* 300:176-187, 1977.

(91) Rueda-Williamson, R., et al. The Program of Salt Iodization for Endemic Goiter Prevention in Colombia. In: *Proceedings of the Seventh International Congress on Nutrition (Hamburg)*. Pergamon Press, London, 1966, pp. 255-278.

(92) Rueda-Williamson, R., et al. La efectividad de la yodación de la sal en la prevención del bocio endémico en Colombia. *Archivos Latinoam Nutr* 16(1):65-68, 1966.

(93) Fierro-Benítez, R., et al. The Role of Iodine in Intellectual Development in an Area of Endemic Goiter. In: *Endemic Goiter and Cretinism: Continuing Threats to World Health*. PAHO Scientific Publication 292. Pan American Health Organization, Washington, D. C., 1974, pp. 135-142.

(94) De León, M. R. Eficacia del enriquecimiento de la sal con preparados de yodo, como medio de prevención del bocio endémico. *Bol Of Sanit Panam* 61(1):1-26, 1966.

(95) Arroyave, G. Sugar Fortification with Vitamin A. Paper presented at the XI International

Congress of Nutrition. Rio de Janeiro, August 1978.

(96) World Health Organization. *Treatment and Prevention of Dehydration in Diarrheal Diseases: A Guide for Use at the Primary Level*. World Health Organization, Geneva, 1976.

(97) Baumslag, N., et al. *Diarrheal Disease and Oral Rehydration: An Annotated Bibliography*. U. S. Department of Health, Education, and Welfare; Office of International Health, Washington, D. C., 1979.

(98) World Health Organization. Guidelines for Nutrition Planning of Primary Health Care Workers and Other Community Workers. WHO Document NUT/80.2. World Health Organization, Geneva, 1980.

(99) World Health Organization. *Methodology of Nutritional Surveillance: Report of a Joint FAO/UNICEF/WHO Expert Committee*. WHO Technical Report Series, No. 593. World Health Organization, Geneva, 1976.

(100) Béhar, M., and C. H. Daza. La desnutrición, un problema social y de salud pública. *Higiene* 28(5):317, 1978.