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## 14 The Importance of Accurate Measures of Malnutrition

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Dr. Bengoa stressed in his paper—I believe very rightly so—the need of an indicator that can be of practical value in assessing the extent of the problem of protein-calorie malnutrition (PCM) in a community.

In the preindustrialized areas of the world, evidence obtained through dietary, biochemical, clinical, and anthropometrical studies, as well as from the analysis of morbidity and mortality data, indicates that the prevalence of PCM in all of its different forms and degrees is greater than would be suspected by nonspecialized persons on the basis of the occurrence of the severe forms, kwashiorkor and marasmus. The above-mentioned studies are complicated, expensive, and time-consuming; furthermore, the information that they provide is difficult for nonspecialists to interpret. Therefore, it would be extremely useful to have indicators that are easily obtainable and that are sufficiently specific and sensitive to be used in determining the magnitude of the problem, both for diagnostic and for program evaluation purposes.

One of the reasons why malnutrition has not received sufficient attention by policy-makers at a national level in many countries is that its real magnitude is frequently unknown or underestimated. As of the last few years, great efforts are being made in the planning of health programs, but even health planners have been unable to give malnutrition its proper place among health problems, partly because of the difficulties in estimating its real magnitude.

Only under situations of acute hunger, as have recently occurred in Biafra and India, do health authorities and the entire society recognize malnutrition as a problem. It would be extremely useful to demonstrate that under “normal” conditions of life more than half the population of a country has suffered or is suffering from some degree of malnutrition. [1] For this purpose, indicators like the one suggested by Dr. Bengoa can be useful.

Responsible persons in underdeveloped countries, frequently even health personnel, have accepted some characteristics of the population like small body size, lack of initiative and ambition, and low work efficiency as genetic characteristics, although available scientific information suggests that these are more frequently the result of environmental factors, among which malnutrition is usually one of the most important. For this reason, it would also be very useful to demonstrate a correlation between anthropometric indicators—like the one suggested by Dr. Bengoa—and functional parameters of the subjects such as resistance to infection, psychological behavior, or learn-

ing capability, even if this correlation does not necessarily prove a direct causal relationship with malnutrition, but rather the influence of the total environment.

There are, of course, limitations in an indicator like body size, which were briefly analyzed by Dr. Wilson, but we should keep in mind that an indicator is not necessarily a direct measurement of the phenomenon but only a practical way of evaluating its magnitude.

In regard to the intervention programs for the control of PCM, we agree with the epidemiological approach recommended by Dr. Bengoa. Through this approach, it will also be possible to select population groups, either in terms of socioeconomic condition or in respect to age, which are more vulnerable and in greater need of attention. This is particularly true for the implementation of measures within the secondary or tertiary level of prevention, such as treatment, nutrition rehabilitation, supplementary feeding, or nutrition education.

In relation to the age groups that should receive greater attention, it is interesting to observe how the situation has changed as more and better information on the effects of malnutrition has been obtained. Until about twenty years ago, supplementary feeding and nutrition education programs were organized mainly for schoolchildren, probably because this group was easier to reach. However, experimental studies revealed that the small size of school-age children cannot be modified significantly by supplementary feeding. [2] Furthermore, the severe cases of protein-calorie malnutrition, mainly kwashiorkor, occurring predominantly between the second and fourth years of life, received great international attention. [3,4] On the basis of these and other related observations, emphasis was progressively and correctly moved from the school-age to the preschool-age child. It was also observed that in the more primitive communities where prolonged breast-feeding (usually over one year of age) is still a common practice, cases of severe PCM, particularly kwashiorkor, were seldom seen before the age of 1 year. For these reasons, the group of children from 1 to 4 years old was identified as the one at greater risk and was therefore granted the highest priority in applied programs. Later on, however, it was observed that even in those communities where prolonged breast-feeding is a common practice, the growth of children was not satisfactory as of the fourth to sixth month of age. Morbidity and mortality statistics also indicated a great risk for children during the second half of their first year of life and during their second year, decreasing rapidly thereafter. [5] In addition, because of its dramatic quality and probably also

its exotic name, kwashiorkor initially received more attention, but later on the importance of marasmus and other severe types of PCM occurring before the first year of life was recognized in population groups undergoing cultural transition, where weaning takes place earlier, and often improperly. [6] It was then realized that all children under 5 years of age, including those under one year, would have to be considered.

More recently, interest has progressively been focused on the possibilities of permanent damage in young children's mental development caused by malnutrition both before and in the 6 months after birth. [7,8] So far, available evidence on the effect of the mother's nutrition on the newborn has been contradictory or inconclusive. [9] On a carefully controlled longitudinal study, now under way in Guatemala, information thus far obtained suggests a good association between caloric intake of mothers during pregnancy (estimated by dietary surveys) and the weight of their newborns. [10] Furthermore, preliminary data suggest that it is possible to correct the low birth weight, so frequent in these babies, by correcting the inadequate dietary intake of their mothers with supplementary feeding during pregnancy. [11] Babies with low birth weight are at a much greater risk of early death, as was recently confirmed by INCAP studies. [12]

All this information indicates the need for directing greater attention to pregnant and lactating mothers, and to children during their first months of life in any applied nutrition program. It seems, therefore, that high priority should be given to the development of a very strong program on maternal and child health within the health plans of the developing countries; not only family planning but also nutrition should be among its fundamental components.

Recent observations in Central America support Dr. Bengoa's contention that activities at the level of secondary and tertiary prevention, particularly those actions which are under the direct responsibility of health agencies, can reduce the incidence of severe and advanced cases without modifying substantially the prevalence of mild or moderate cases. These last forms, although clinically not very dramatic, can be of greater public health significance because they are more prevalent, and especially if their association with functional damage is further documented. The control of these forms requires a strong coordinated program at the level of primary prevention, which should correct the basic and interrelated problems of insufficient and inadequate supply of foods, low purchasing power, and low educational level. This can be done only through coordinated multisectoral programs, properly oriented by

a national food and nutrition policy and constituting an important component of the national development plan.

In order to convince the planners and the policy-makers of the need and feasibility of this last approach, efforts are being made to sell the idea on an economic basis, that is, to demonstrate that the expenses involved in measures of direct nutritional benefits are a good investment. Dr. Wilson indicated the complexity of this approach and the difficulty in obtaining the basic information required. Still, I believe that it is possible to obtain a reasonably good estimate of the immediate economic losses due to malnutrition in a given community by calculating, among other items, the expenses incurred in the treatment of cases, and the losses due to absenteeism of workers because of diseases related to malnutrition, as well as those resulting from reduced work performance. However, these immediate losses are probably much lower than those stemming from early malnutrition. The effects of malnutrition during the intrauterine period and in the course of the first few years of life, in terms of lower learning capacity and inefficient integration of the labor force in a technological society, are much more difficult to estimate in economic terms; furthermore, they appear after a time lag of at least 10 to 20 years. This is, of course, a serious limitation to planners or to politicians interested in investments with a more immediate return. Therefore, the improvement of these fundamental programs is postponed, and the gap between the developed and the underdeveloped societies increases.

I agree that, for effectiveness, any intervention program to control malnutrition has to be an ambitious one, which may even require significant changes in the socioeconomic and political structure of the country. Therefore, very careful planning is fundamental.

Some countries and international agencies interested in the field are already working in this direction. In my opinion, the efforts for socioeconomic development in the last decade have demonstrated that greater attention to human resources and improvement of the quality of life of the total population of the country is needed. This is not only the final objective of development but also a mechanism for achieving a real and harmonious socioeconomic development, not just economic growth.

I fully appreciate, therefore, the interest in and efforts toward utilizing a more strict planning methodology, for which I am sure this conference will be of great value. Still, I think that in planning the control of malnutrition we should not completely forget the humanitarian aspects. Unfortunately for us who are interested in nutrition, there is very little probability that a highly

influential or policy-making citizen will go to bed hungry or will have a child dying from kwashiorkor or marasmus, as is happening every day to thousands of people in large areas of the world. If that were the case I am sure that, in addition to the "rational" economic approach to the prevention of malnutrition, a higher social and humanitarian consciousness would be awakened.

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