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MEETING OF A PAHO/WHO TECHNICAL GROUP ON RESEARCH ORIENTED TO NUTRITION ACTION THROUGH PRIMARY HEALTH SERVICES

Bogotá, 16-20 June 1980

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1. Nutrition problems

Malnutrition in young children is undoubtedly the most serious nutrition problem in the developing countries because of its magnitude, characteristics and economic and social consequences. Malnutrition continues to be one of the leading couses of sickness and death among children below age five in those countries. The Investigation on Mortality in Childhood coordinated by the Pan American Health Organization in the Region of the Americas revealed that malnutrition or immaturity is the basic or associated causes of 57% of all deaths of children below age five. Moreover, it has been found that young children surviving advanced malnutrition have a low intellectual and physical performance, resulting not only from inadequate food intake but also from the lack of the psycho-social and affective stimuli that assure mental development in a child.

Contrary to what was expected as a result of economic progress in certain countries, the problem of malnutrition among children is increasing. This has been corroborated in five countries of the Central American area. This increase extends both to the number of individuals affected and to number of population groups at risk of malnutrition.

The significant growth of knowledge in the food and nutrition areas in the last 30 years has not been matched by a parallel increase in the application of that knowledge within the community. There are several reasons for this. One of the major obstacles has been the persistent use of conventional methods for delivering services and the extremely low coverage of health and nutrition services in some countries. The groups at highest risk have almost invariably been those receiving the lowest coverage. The situation is recognized by the governments and has led them to develop and expand their primary health services as a strategy for expanding the coverage of health services. It has also been observed that efforts to improve feeding practices are based on principles which are not always attuned to local conditions, and that nutrition recommendations addressed to the various members of the families cannot be followed by them because they are unrealistically at variance with prevailing conditions.

It is therefore urgent, indeed imperative, to develop types of technology tailored to local conditions that can be used by the health services, particularly at the primary care level, in solving nutrition problems. This requires new approaches, which ideally should be based on community participation and a more effective use of existing resources. Active community involvement is especially important in nutritional work, for it is the local population that takes the final decisions and actions to improve food practices. This is something that cannot be done for the people. In regard to utilization of local resources, recent advances in food practices could be achieved in most places where malnutrition is widespread by using the locally available food. Present knowledge in the field of nutrition makes it possible to devise a nutritionally adequate diet based on the foods available under a wide variety of ecological conditions and

affordable by the various population groups. This has been proven by means of controled epidemiological and clinical studies. What now remains to be done is to determine in a systematic way, under the conditions prevailing in a particular community, whether this is applicable to the different age groups, especially to young children, whose nutritional requirements are proportionally greater than those of adults, and to endeavor to identify and remove the possible constraints to the achievement of this purpose.

Another important consideration is that malnutrition is particularly common and severe in young children and that the weaning period is, without a doubt, the most critical time from the point of view of nutrition, especially from the time that the mother's supply of milk become inadequate to meet the nutritional needs of the child until the child is two or three years old and begins to share the diet of the rest of the family. During this period, dietary restrictions, acting synergistically with early childhood infections, give rise to high rates of morbidity and mortality and lead to serious physical and mental deterioration in the surviving children. The dietary to which constraints which young children are subject during the weaning period are based primarily on inadequate practices and insuficient knowledge of the increasing dietary needs in these age groups.

Also because of ignorance of the basic principles of hygiene and sanitation, the food provided to children during the weaning period are a common source of recurring infections, in addition to being nutritionally inadequate. The child is subject to periodic attacks of diarrhea during which, owing to mistaken cultural patterns, it is subjected to dietary restrictions that trigger a vicious circle of diarrhea and malnutrition. It should also be noted that there is increasing evidence that malnutrition in the mother has adverse effects on the weight of the child at birth and in morbidity and mortality prior to weaning. This indicates a need to protect the child during its intrauterine life, which is critical from the nutritional point of view.

Based on the above considerations, it is proposed that a new strategy be established by the health sector for preventing and controling malnutrition. The two major components of this strategy are: to attack the problem initially during the most critical period in the life of a child, namely the first three years of life and the prenatal period, and to achieve maximum utilization of local resources by promoting and encouraging breast-feeding and making use of the locally available and acceptable foods and dietary supplements until the child is able to consume and assimilate the same food as the rest of the family.

The problem of malnutrition, extremely widespread and very complex, may become more manageable in the health centers' potential contribution to its solution is identified more clearly. The knowledge and experience acquired should make it possible to ensure a better integration of nutrition with primary health care, thereby encouraging and facilitating the inclusion of nutrition activities and the achievement of nutrition goals in national health plans. This will also provide a basis for developing significant activities as part of the programs conducted by the agriculture and education centers, particularly as an integral and coordinated part of national food

and nutrition plans. The health center should therefore be prepared to contribute in a very definite way to national development efforts.

2. Research in nutrition and food science

The countless studies done in recent decades on food and nutrition have undoubtedly laid the groundwork for the enormous progress of various nutrients and the recognition of their sources and functions, the major part of the efforts was focused on the study of the various deficiency diseases from the epidemiologic, physiopathogenic and clinical standpoints, on the diagnosis of the food and nutrition situation in countries and regions, and on determination of the composition and nutritional value of locally available foods. At the same time, energy and nutrient requirements for individuals and community groups were established and the corresponding nutrition and food recommendations were developed.

The attention of researchers was later directed to the determination and analysis of the many causative factors where interaction leads to deficiency diseases in developing children and to their negative effects on individuals, in particular, and the various development sectors in general. The best methods and procedures for preventing and controling these deficiencies were also determined.

The recognition of the multicausality of nutritional diseases and the multisectoral nature of their determining factors, as well as their adverse consequences or effects, prompted the study and formulation of national food and nutrition policies and plans as an integral part of a country's national development plan. All this is evidence of an increasing awareness in the country's decision-making level of the magniture and importance of nutrition problems and the high priority to be given to food and nutrition programs within the context of coordinated and simultaneous multisectoral and multi-institutional action directed to the population at greatest risk.

Food and nutrition research and studies in recent decades has covered a broad spectrum of directly or indirectly inter-related areas. The following are the principal areas in which studies have been made or are going forward in Latin American countries:

1. Nutrition surveys at national, regional, and local level covering representative samples of the population or specific groups and aimed at assessing the nutritional status of the population.

2. Studies on food intake and food habits prevailing in various population groups.

3. Studies of growth in malnourished children and in healthy, well-nourished children, which have made it possible to establish the effect of malnutrition on growth and also determine the normal patterns of growth in a number of countries.

4. Various types of research on the physiology of nutrition and on

various epidemiologic, physiopathogenic, clinical, and biochemical aspects, as well as the prevention, treatment of and recovering from, protein-calorie malnutrition, nutritional anemias, hypovitaminosis A, endemic goiter, and dental caries, which are the deficiency diseases most common in the Region.

5. Relations between malnutrition and mental development and among malnutrition, infections, mortality, demographic aspects and various environmental conditions.

6. Studies on the composition of food and on sources and absorption of various nutrients.

7. Research on nutrient metabolism and nutritional requirements of individuals and groups in the community.

8. Research on new formulations and food technology and on various aspects related to the improvement of their nutritional quality and characteristics.

9. Studies on acceptability and marketing of new food formulations.

10. Research on the improvement of seeds and animal species, on the applications of improved agricultural and stockbreeding practices, and on food storage, preservation and distribution systems.

11. Studies on aspects of staff training and on food and nutrition education projects addressed to the community.

12. Research on preparation and implementation of food and nutrition surveillance systems.

13. Examples of simplified systems for the delivery of integrated health services, including strategies for primary care and for community involvement in the development of health and nutrition programs.

14. Studies on preparation and coordination of national food and nutrition policies and plans.

An analysis of the areas covered by this research shows two things: first that there are many important findings and that much scientific and technological knowledge has been acquired as a result of the impressive progress made in the nutrition and food science in recent decades; and second, that there has been more interest in the past in acquiring information in increasing abundance and detail about the characteristics and effects of the various nutrition problems than in delving into the causative factors that operate at the local level and the mechanics and operational programs for eliminating them. The gap is particularly apparent in the shortage of studies that carefully analyze and evaluate programs and projects in progress so as to measure their impact, examine their operation, and determine what changes need to be made to assure more significant results. In addition, few surveys have been made for the purpose of designing new approaches and

types of food and nutrition intervention that might yield better results in terms of significantly reducing the problem in low-income communities.

This points up the urgent need to carry out operations research studies in the countries of this Region in which required knowledge is put to immediate use in health care and service schemes in order to evaluate their efficiency and effectiveness for improving the existing situation, especially in regard to the diet and nutrition of pregnant women and young children.

The above listing of the many and varied studies and investigations carried out in the region in recent decades, which are similar to those conducted in other regions, confirms the growing interest in food and nutrition problems, explains the considerable progress in scientific knowledge and technology in this field, and makes it apparent that researchers in the field of food and nutrition and workers in health, education, nutrition and food production have made highly valuable contributions to the efforts to combat the prevailing problems of nutrition.

The fact, however, is that with only a few exceptions the developing countries continue to be plagued by high rates of malnutrition and morbidity and mortality in young children, as a reflection of the persistence of the causative factors and in spite of the major efforts made in food and nutrition programs. In these circumstances, it appears reasonable and timely to examine the possible factors leading to these conditions so that research and action in this field may be redirected.

3. Factors contributing to the persistence of malnutrition problems

It must be recognized that some of the factors that may explain the persistence of nutrition problems may be structural and perhaps cannot be readily altered by unisectoral or multisectoral interventions in favor of the population groups at greatest risk. These factors include all those which in one way or another determine family income and purchasing power, which in poor communities are one of the major constraints on an adequate diet. However, it must also be acknowledged that, until such time as the differences in economic and social progress among the various strata of the country are significantly narrowed, there is much room for action by workers in health, education, nutrition and food science, with considerable opportunities for bringing about, by gradual stages, a significant reduction of the prevailing nutritional problems.

As a point of departure for identifying those factors that could be altered through innovative approaches and interventions and the reorientation of actions and programs currently underway, a list is given below of some of the constraints that may be contributing to a greater or lesser extent to the persistence of nutrition problems, particularly in mothers and children in the lower socioeconomic strata:

1. The conditions impeding an improvement of the income and educational levels of families in the lower socioeconomic classes remain unchanged.

2. The present coverage of programs for improving the diet of the more vulnerable population groups is still limited, and therefore the programs are not succeeding in bringing about significant improvements in the diet of the target population.

3. The present programs often include only a low percentage of mothers and young children, and these are the groups that, being most vulnerable to nutritional and health damage, should receive priority attention.

4. The most appropriate principles and methods are not always followed in the planning, execution, follow-up and evaluation of existing programs, and in many cases standards for their operation have not been established.

5. Those planning and executing programs are at times unfamiliar with and therefore are not applying the advances achieved in scientific knowledge; accordingly, the design and the methodology used is often such that the expected results are not achieved.

6. Considering the many and varied investigations that have been done or are currently in progress in the area of food and nutrition, there have been relatively few studies of an operational nature aimed at eliminating the nutrition problems affecting extensive population groups, whereas the studies directed to obtaining knowledge in greater detail and depth on these problems and their consequences have been numerous.

7. Furthermore, the traditional orientation has led researchers to put more emphasis on descriptive studies dealing with individuals than on operations research on community groups and studies have been more responsive to the particular interest of the researcher or funding institution than to an interest in solving problems detected by the field worker in the community.

8. Generally speaking, there has been little coordination between the researcher and the executor of the applied programs and the latter has been given no opportunity to participate in the design, planning and execution of the investigation.

9. Even allowing for the considerable time it usually takes for new scientific knowledge to be disseminated and recognized, it is obvious that many researchers have often been more interested in the publication of their findings in scientific journals than in the immediate and practical and application of those findings in solving the problems of nutrition prevailing in their own country or the developing countries in general.

10. There is a yawning gap between the amount of new knowledge in the food and nutrition area stores up in scientific libraries and the immediate, direct and actual application of the knowledge in health, nutrition, education and agriculture in the developing countries.

11. Though there is already evidence of the unfavorable effects of malnutrition, particularly anemias, on a country's economic and social development, researchers have not placed enough emphasis on these studies and development planners are still giving low priority to funding for health and nutrition programs.

12. At the various operating levels there is not sufficient information and knowledge as to the magnitude of food and nutrition problems and their impact on the health and education sectors, so that the inclusion of activities in this field is very limited.

13. Community education programs continue to be conducted by ineffective traditional methods, and little has been done to put more emphasis on the investigation and development of more efficient methodologies that can be better fitted to local conditions.

14. The active participation of the community itself in health and nutrition programs has not been sufficiently promoted or studied, nor have the means of bringing this about so as to eliminate the paternalistic character of present programs and make them self-sufficient and continuous.

4. Questions on food consumption and utilization in poor communities of the Region

As a general frame of reference for identifying and locating possible areas for action-oriented nutrition research in a country's food and nutrition system, the principal factors influencing the consumption and biological utilization of food in young children and mothers belonging to urban and rural communities in the lower socioeconomic strata are listed below.

This listing is designed for use in pinpointing the questions to which answers must be found before food and nutrition activities aimed at significantly improving the diet of children below age three and particularly of pregnant women and unweaned infants, can be conducted with the active involvement of the families. The justification, components and anticipated effects of such actions, as well as the intervention mechanisms and methods for carrying them out, should be the subject of specific investigations, the primary purpose of which should be to assure their maximum effectiveness and efficiency.

There are sharp differences between low-income communities in the cities and in rural areas. Accordingly, some of the questions refer primarily to only of these two groups.

A. Production subsystem (refers to the local level)

In rural areas with a subsistence economy, which in some Latin American countries account for a high percentage of their total population, the food consumed in the home depends basically on the crops grown and livestock raised in small family plots and the sorrounding area. Few products go into

the market economy, and therefore the food goes straight "from the field to the pot". In these circumstances, answers must be found to the following questions if the diet of young children and pregnant women is to be improved:

1. What are the prevailing habits and customs in regard to subsistence crops in the different areas of the country?

2. What factors are involved in the persistence of the prevailing farming practices?

3. What is the average length of the period of breast-feeding in the different rural areas?

4. At what age are supplementary foods usually given to young children, what kind of foods are these, and what is the child's diet after weaning?

5. What is the usual diet of rural women during pregnancy and lactation?

6. What are the patterns of intra-family distribution of food in the rural family?

7. What factors determine the prevailing food habits, particularly for young children and mothers?

8. How could the nutritional value of the diet of young children and mothers be improved by using locally produced foods, and what other foods could be produced to ensure a greater variety and better combinations of food?

9. How would it be possible to take advantage of local foods and food-preparation habits and customs in order to introduce changes to ensure a substantial improvement of nutrition for mothers and children?

10. What amounts of locally produced foods are lost, and why?

11. What are the most practical and simplest systems for storing and preserving food in rural areas, at the family level, so as to prevent such losses?

12. What seasonal variations are there in the availability of foods for the family?

13. Could income and the availability and use of foods be improved by organizing small community cooperatives or associations of rural producers?

14. What mechamisms should be used to motivate mothers and the community at large to participate in nutrition improvement programs?

The local production subsystem does not have as direct an influence on the diets of families in poor urban areas, except in isolated instances

in which a family has a small area available for planting some vegetables or raising a few animals. For the poor inhabitants of cities, the major constraints are related to employment and income. However, most of the questions listed above in regard to rural families are valid for urban families as well, especially the questions relating to food habits and community participation in the program.

B. Marketing system (refers to local level)

The factors relating to the marketing of food at the local level, which very strongly influence food consumption by families in the lower socioeconomic strata, are particularly important in poor urban communities, where the low levels of income are a serious barrier to achieving a quantitative and qualitatively adequate diet for young children and mothers. Family decisions on purchasing food in the local market or the "corner store" depend on a combination of two factors: beliefs and habits and family income. The amount of money available from this income is, as a rule, seriously ended by the need to cover the costs of housing, utilities, transportation, clothing, etc., these expenses being much higher in cities than in rural areas.

Moreover, certain food purchasing practices (a day at a time, on credit, in small amounts) make the cost even higher and limit the supply of food available in the kitchen pantry. Hence, the questions in the food marketing area with greatest relevance for identifying actions that may be helpful in improving the family diet, particularly for young children, mothers, would be:

1. What are the prevailing practices pertaining to the purchase of food in low-income communities, especially in poor rural areas?

2. What is the influence of commercial advertising on the consumption of food of low nutritional value?

3. What are the major constraints on the purchase of food in such communities, and what factors determine the decisions on the purchase of food?

4. How is the family budget distributed in the various population groups?

5. What types of changes in food purchasing practices and decisions might be introduced so as to improve the diet, particularly for young children and mothers?

6. How can more a rational distribution of the scant family budget be encouraged and achieved?

7. What mechanisms can be used to stimulate the active participation of the community in bringing about a better utilization of its own resources for the acquisition of food for the family?

8. To what extent would it be feasible to organize small cooperatives or other associations of consumers having as their purpose the reduction

of the cost of food and rationalization of the purchasing decisions in the poor areas of cities?

9. How can practices be introduced that make it possible to preserve food in the home so as to take advantage of low prices prevailing at harvest time?

C. Consumption subsystem

The factors shaping family and individual consumption of foods in low-income communities are related, first of all, to the production and marketing factors mentioned above that determine the availability of food at the local market or "the corner store". It is recognized, however, that there are many other economic and cultural factors that influence the actual availability of foods in the family pantry. Furthermore, once the food is in the home, the size of the family, the cooking methods used and the practices on intra-family distribution of foods will finally determine the amount and nutritional quality of the foods consumed by each member of the family unit, and specifically by young children and by women during pregnancy and lactation.

This leads to a further series of questions to be answered by investigations directly aimed at providing guidelines for nutrition action. The following questions should be considered in addition to those already posed:

1. What are the positive and negative aspects of the practices regarding acquisition, preservation, preparation and intra-family distribution of food in the low-income groups, with sepcific reference to the feeding of children below age three and the diet of women during pregnancy and lactation?

2. What factors are responsible for mistaken food practices, and what changes need to be made, within the existing restrictions, in order to improve the diets for women and young children?

3. How are foods preserved and handled, especially those for young children, and how could these practices be improved?

4. What foods and food mixtures might be obtained locally, within the existing restrictions, in order to bring about a significant improvement in the diet of mothers and young children?

5. What methods are recommended for preparing such foods and mixtures in accordance with procedures consistent with the prevailing socioeconomic restraints, and in what amounts and what forms is it recommended that they be consumed by young women and pregnant women?

6. Which are the most feasible and effective mechanisms for ensuring community participation, particularly of mothers, in the program directed to improving the diet of pregnant women and young children?

7. What are the prevailing practices and motivations on spacing of the children, and how can they favorable modified?

8. Which are the most appropriate educational methods and techniques for non-formal programs on food and nutrition education addressed to the community?

9. How can the locally available institutional, human and material resources be used to the best effect in food and nutrition improvement programs directed particularly to mothers and young children?

D. Biological-utilization-of food subsystem

The factors that determine proper utilization of ingested nutrients by the organism depend on the state of health of the individual. Massive infestations by certain intestinal parasites reduce the absorption of certain nutrients, and the urinary excretion of nitrogen increases considerably during the course of infectious diseases. These nutrient losses, so common in the poor communities of developing countries, which are subject to a very high incidence of infectious and parasitic diseases, have made it necessary to increase the estimated requirements and food production targets in a country by a given percentage in order to cover the added demand resulting from the chronic losses mentioned above.

In addition, the intake of the food in the home is often reduced, especially that of sick children, because of the anorexia that often accompanies infectious diseases. Furthermore, owing to mistaken cultural patterns the sick child is subjected to severe dietary restrictions which further exacerbate malnutrition, leaving the child even more vulnerable to disease. The synergic interaction of malnutrition and infection has been soundly documented in recent decades by many clinical, laboratory and fiels studies which have also shown that this synergic relationship is the principal cause of a high percentage of deaths in children below age five and therefore one of the major obstacles to a prompt reduction of morbidity and mortality rates in infants and in children one to four years of age.

The proven synergic action of malnutrition and infection amply justifies the inclusion of specific nutrition activities in mother and child health programs conducted as part of primary health care and also warrants giving a high priority to such programs within national food and nutrition plans.

In regard to the biological utilization of nutrients by mothers and children in the disadvantaged classes, there are other important questions that should be subjects of action-oriented studies and investigations:

1. What are the prevailing habits, beliefs and practices among the various groups in low socioeconomic levels in urban and rural communities with respect to health and disease, an understanding of which might be helpful in orienting health and nutrition action?

2. What is the present health and nutrition situation of the area, with special reference to young children and pregnant women, and what are its major determinants?

3. What is the present status of family health care programs in the area and how can they be extended and improved?

4. What is the present status of basic sanitation in the area (water supply and excreta and solid waste disposal), and how could these services be improved?

5. What approaches would be the most appropriate, and what mechanisms the most effective, to ensure active community participation in primary health care programs?

6. What constitutes a simple health and nutrition surveillance system, and how can it be implemented as part of the primary health care program?

5. The need for a new action-oriented research

As a result of abundant laboratory, clinical and epidemiologic research, sufficient knowledge is now available in the food and nutrition areas to serve as a basis for preventing the nutrition problems prevailent in developing countries and bringing them substantially under control.

However, it must be recognized that this knowledge has not been adequately or completely applied; in addition, the type of operations and field research needed in order to transmit this knowledge and translate it into feasible and effective action programs has not received sufficient attention in the past, a situation that urgently needs to be changed.

The main objective of an action-oriented research program in the food and nutrition field is to identify and facilitate practical actions that can be taken at community level, even within the context of the economic and social constraints existing in the target areas. By means of such actions, malnutrition, at least in its most severe and obvious forms, could be eradicated from the countries in the Region of the Americas in the consence of the next two decades, through an improvement in the diet of the poor.

In order to reach this objective it is considered necessary, on the one hand, to conduct research related to the priority areas, including improvement of the diet of children less than three years of age and pregnant women, and to the possible nutrition components of the primary public health services package provided to lower-income communities, particularly in the field of maternal and child health. It is also considered necessary to make a deliberate effort to chieve a wider dissemination of nutrition knowledge that can be applied in a practical way by workers in health and other related disciplines, especially at the intermediate and local lvels. It is imperative that the health workers, who are the one responsible for providing maternal and child care services at the local level, be involved more actively in action-oriented research of this kind.

The principal areas regarded as having priority for action-oriented programs of research on the diet of mothers and young children would be the following:

A. Identification, development, evaluation and promotion of inexpensive, locally available, culturally acceptable, food supplement for unweaned infants and young children in low-income communities

The stage of an infant's life at which a rapid change takes place in its diet -from breast-feeding alone to the regular family diet- is genuinely crucial. This period, extending from the sixth to the 24th month of life in most rural communities, has been defined as the time of greatest vulnerability to infection (especially gastroenterities) and malnutrition. These two problems, separately or combined, are major determinants of high morbidity and mortality rates among unweaned infants and preschoolers.

The most important points to be considered in connection with the weaning include the age at which food supplements should begin to be given in conjunction with breast-feeding, and the type and amount of such foods, how they are prepared, the frequency of deliveries and cost. It is therefore considered necessary to take the following activities into account:

- Determine how the nutritional requirements of the child during this period can be satisfied on the basis of locally available and culturally acceptable foods affordable by the poorer classes.

- Identify and evaluate easy-to-prepare food formulas that can be used in the home and at community level.

- Identify practical problems that may arise in promoting the use of such new food formulas, so as to devise means of eliminating such problems community-based activities.

In many countries of the region significant efforts have been made to develop food supplements for unweaned infants and young children based predominantly on locally available foods accepted by the target community. However, not all of these formulations have been systematically examined from the standpoint of their nutritional value, acceptability to the mothers and children, digestibility by young children, tolerance, amount and frequency which they should be given in order to satisfy calorie requirements, and packaging, storage and distribution systems making it possible to preserve the quality of the food and avoid the danger of bacterial contamination.

For foods other than those which are commercially prepared, it is important to be certain that they include adequate amounts of certain nutrients such as iron, a shortage of which can impede the normal growth of the child even with an adequate intake of protein and energy.

This suggests the need to obtain all possible information on the foods used for weaning and as supplements in the various countries, regions, and specific communities, in order to analyze them for nutritional value and, when necessary, consider ways of compensating for deficiencies of specific nutrients and subsequently promote their consumption in adequate quantities.

In some Latin American countries the foods used to supplement mother's milk, which are based essentially on corn, rice, bananas, beans and cassava, have a low calorie density and are bulky. This places a serious limitation on the diet of unweaned infants and young children, who are unable to consume sufficient amounts of these foods to meet their calorie needs. There are two possible ways of eliminating these problems: bulky dietetic formulations can be given in smaller amounts and with greater frequency, or the calorie density of the formulation can be increased by adding in a locally available source of carbohydrates, such as a vegetable oil.

In developing food formulas for infants being weaned or of food supplements for babies still being breast-fed, it is often necessary to develop simple techniques, geared to the conditions of low-income groups, for preparing such foods. The acceptability of the formulas and the methods for preparing them should also be investigated under the conditions normally prevailing at the community level, so as to determine the extent to which they are compatible with the cultural and economic realities of the families for which they are intended. This is important in nutrition programs, since there are known instances in which weaning formulas prepared with low-cost, locally available foods have not been accepted or utilized extensively by the target community. The reasons for this have not always been established, and it is therefore advisable to examine the relative importance of the factors that have prevented acceptance of such weaning formulas by the community.

It is considered essential to study the cultural practices and traditions that determine the type of food supplements introduced as part of the diet of unweaned infants and the time at which this is done. The studies should consider a broad spectrum of factors and inter-relations among the various elements involved in the preparation of the foods and in the feeding practices. Such factors include family structure, the role of the various members of the family, local production of food for consumption in the producer's home food preparation methods, the attitudes and practices relating to the feeding of unweaned infants and young children health and disease, time and financial constraints, the availability and utilization of an appropriate technology, community-group leadership and community participation, the prevailing information and education systems, local ecological characteristics, etc. A complete knowledge and understanding of existing behavioral patterns with respect to nutrition and health as considered vitally important so that the educational contents and activities may be adjusted to the prevailing food customs and habits that it is hoped to change for the better.

The information supplied to mothers and the community on supplemental food formulas for unweaned infants and young children should be made available in a form that makes it readily understandable to all concerned. This requires carefully planned educational activities conducted on the basis of appropriate messages and methodology, using appropriate educational channels, and making maximum use of the community's own resources, including participation of the families at hich the program is directed and of all community service units available at local level in the sectors of health (especially primary care) education, community development and, in rural areas, agricultural extension.

Actually, appropriate methodologies have not been developed in this area of education, though a few isolated individual studies have been carried out. However, it is considered important to investigate, particularly, any

shortcomings which have been found to exist in the teaching methodologies and techniques and the educational strategies used in the past in this type of programs. It is very possible that different methodologies and strategies ought to be used in different countries, since the cultural conditions also differ in each of them. The basic aim of the studies should be to develop strategies that can be used successfully in the transfer of new feeding formulas to supplement the mother's milk received by unweaned infants and later, in the pre-school years, to ease the transition to the usual diet of the family.

Such studies obviously require the simultaneous participation and close teamwork of a broadly based group of social scientists: anthropologists, sociologists, behavioral and communication scientists, education experts, epidemiologists, community development experts, etc., along with specialists in the field of health and nutrition.

B. Research at community level on the interaction of infection and malnutrition, with emphasis on parasitic infection

The important role of nutritional status vis-a-vis susceptibility to infections, is widely known, as is the adverse of impact of infection on nutritional status and the immunizing mechanisms, especially in children. While there is much information on these inter-relations as far as bacterial diseases and infections are concerned, the same can not be said regarding parasitic infections. This is particularly important in countries with a high prevalence of a wide range of helminthic infections, particularly ascaris, giardia and hookworm. The contribution of these parasitic infections to malnutrition in these areas deserves special attention because of the decisions that must be made in maternal and child protection programs on the advisability of carrying out large-scale deparasitation campaign or activities with the aim of reducing the prevalence of malnutrition. Malnourished children are generally highly infested with intestinal parasites, but it is not clear whether this is merely an association or if the infestation has some etiologic significance. The findings of laboratory studies indicate that individuals with massive infestations of intestinal parasites suffer a loss of ability to absorb certain nutrients; however, few studies have been done to determine to what extent this may exacerbate an existing state of malnutrition, and nothing is known about whether the severity of parasitosis load is a critical factor in this context.

In many food and nutrition programs in which food supplements are given to children, concurrent deparasitation has been recommended as a means of increasing the beneficial effects of the food supplements. However, control studies are needed in order to determine if this is actually true. The question of whether deparasitation by itself may improve the growth and nutritional status of children also needs to be clarified.

The results of such studies would place the importance of parasitic infection as a contributing factor to infant malnutrition in a proper perspective and make it possible to define the need to control such infestations in order to improve the nutritional status of children, particularly as one more element in mother and child protection programs that may be recommended in the future.

Another important aspect in connection with infections and intestinal infestation is the need to study and establish a simple method for the prevention and prompt treatment of diarrhea in young children for the purpose of preventing severe dehydration.

Diarrheal diseases have been identified as a very important cause of malnutrition and of high mortality rates in unweaned infants and children below three years of age. This is because they lead to dehydration in various degrees of severity that can result in the death of the child. It is also widely recognized today that adequate, and timely rehydration is a saving measure than can and should be initiated and carried out at the level of the community itself, simultaneously with the nutritional rehabilitation of the child. Studies made in some countries suggest that prompt oral rehydration may be associated with a subsequent response that makes possible the nutritional rehabilitation of the child by means of a mechanism which is not clearly understood. This should be the subject of research to confirm this hypothesis.

C. Research on malnutrition in the mother and its adverse effect on the newborn child, and identification of actions and interventions at community level to prevent this effect

Studies carried out in a number of countries have shown that the nutritional state of the mother during pregnancy has an obvious effect on fetal growth and on the characteristics of the newborn child and its nutritional behaviour and health during the first year of life.

In the developing countries the prevalence of low birthweight (less than 2,500 grams) is high and has been related to low socioeconomic levels of population groups in which this finding is frequent. A poor nutritional state of the mother before and during pregnancy is one of the factors responsible for low birthweight; it has further been found that supplementary feeding, especially in the last three months of pregnancy, brings a considerable improvement in the nutritional state of mothers whose diet is inadequate and increases average birthweights. However, practical problems have prevented this knowledge from being applied in large-scale programs in developing countries. Similarly, anemia caused by iron and folate deficiencies is a very frequent complication in pregnancy which has serious implications for the health of the mother and child. Although it would be possible to correct this anemia by distributing ferrous sufate and folic acid in tablets, which is relatively easy to do, the fact is that this simple means of preventing and treating ferropenic anemia in pregnancy is being applied in very few countries. This shows the importance of investigation to determine the obstacles that stand in the way of very simple programs that could have very favorable effects on the health of mothers and infants.

A report has been issued on a study in which iron and folic acid tablets were administered to anemic pregnant women and the results were associated with a significant increase in the weight of the infant at birth. This finding, however, has not been confirmed in other studies, so that it would be well to examine the validity of this important observation.

The mechanism by which iron and/or folates can be administered to improve the weight of the baby at birth is still not known; it would therefore be necessary to determine whether this involves a metabolic effect or a direct result of an improvement in appetite and a correspondingly greater intake of food.

Another important point to be investigated in connection with mother and infant nutrition is the extent to which urbanization and industrialization lead to a reduction in the prevalence of breast-feeding and thereby expert advise effects on the nutritional state of infants, particularly those in low-income communities or population groups.

Breast-feeding practices vary considerably from country to country, and even among different regions of one and the same country, or among socioeconomic classes. However, in all countries it has been found that breast-feeding goes on for much longer periods in rural than in urban areas, for an average of 12 or even 24 months. This practice of prolonged breast-feeding has highly favorable effects on the nutrition of the child and it is considered that in some places it is a fundamental factor in ensuring the proper nutrition or even survival of the infant. Nutrition problems in the infant population would be much more serious if this cultural pattern of prolonged breast-feeding did not persist in the lower socio-economic classes.

Unfortunately, in most of the developing countries the trend of migration from rural areas to the cities is strong and has let to a very rapid urbanization of the population. Accordingly, the practice of prolonged breast-feeding has become considerably less widespread. This has resulted in a serious deterioration of the nutritional state and health of unweaned infants living in poor urban areas.

It is generally considered that during the first six months of life breast-feeding is sufficient to keep an infant in an adequate nutritional state. However, sufficiently complete studies have not been done to determine whether new foods should not be introduced at earlier ages as a supplement to breast-feeding. Such studies may make it possible to provide scientifically-based advice on the best way and the best time to introduce unweaned infants to food supplements.

Moreover, research should be devoted to determining the best methods for use in educating mothers on breast-feeding and on the food supplements that should be given to infants until they are gradually begining to take all the foods included in the diet of the rest of the family.

It is a well-known fact that the diet of pregnant women is often inadequate in both quantity and quality. In the developing countries one frequently find pregnant girls who, in addition to carrying a baby, continue to do household work with no reduction of physical activity, which means that their nutritional requirements are tripled; nevertheless, their diet continues to be restricted and nutritionally unbalanced. This is why most countries have established programs to assist these women whose nutritional

requirements are increased during the period of pregnancy and lactation. However, it is considered necessary to establish definite criteria for identifying those women at highest risks of malnutrition, since it is not possible to provide nutritional assistance in a country to all pregnant women in the lower socioeconomic classes. This criteria for measuring the greater or lesser risk to which the various groups of pregnant women are exposed should be the subject of studies to provide guidelines for selective and priority action under maternal care programs.

D. Identification, development and implementation of methods for the control of nutritional anemias

Iron deficiency anemias are very prevalent in most developing countries in the Region of the Americas, although the prevalence varies from country to country. The problem is particularly serious among women of reproductive age and pre-schoolers, in whom the onset of ferropenic anemias is significantly related to dietary factors. Although the intake of iron as part of the customary diet frequently exceeds the nutritional recommendations, the iron requirements are not always covered because not all of the iron is absorbable, given the presence of inhibiting substances such as phytin and tannin in diets based on cereals and vegetables. Quantitative improvement of such diets to make the iron more absorbable is a difficult matter and should be the subject of scientific research. Further, efforts to control anemia by distributing iron and folic acid tablets through the local health services fail to reach a significant part of the target population. Another approach taken in studies and practical interventions in some countries has been to fortify foods with iron in order to increase iron levels and prevent deficiency anemias. However, determining the actual coverage of specific projects to fortify a particular food by adding iron as well as determining the practical problems involved in such programs, requires very detailed studies on the actual levels of consumption of that food by the target groups, i.e., by those in which there is already a high prevalence of ferropenic anemia: particularly pregnant women and pre-schoolers of the lowest socioeconomic classes.

6. The nutrition component in the primary health services package

Despite the extraordinary technical advantages made in the health sciences, hundreds of millions of people in the world, indeed the majority of the population in the developing countries, continue to be in a deficient state of health. The bulk of the scientific and technical knowledge related to health and nutrition is contained in scientific books and journals but not reflected fully in better health and nutrition levels for the population. Actually, there are many reasons why information as valuable as this is being applied to so small an extent. The search for knowledge has not always been accompanied by specific plans with clear objectives for applying it; interaction among the scientist, the administrator and those who make the policy decisions has frequently been inadequate, and aministrators and planners have often assigned a very low priority to health and nutrition in the national development plans.

Conventional health systems have often been transferred intact from developed to developing countries without first being adapted to the particular context and circumstances of the countries where they are put into practice; it is not surprising, then, that such systems have not been effective in meeting the real needs of the bulk of the population where they are applied. It is neither possible nor desirable to continue transferring such conventional systems in this way. The International Conference on Primary Health Care, held in Alma Ata in September 1978, determined that the primary health care approach is essential for achieving an acceptable level of health in the world in the near future as an integral part of social development and in keeping the spirit of social justice. It is considered that this approach will make it possible to reach the goal established by the World Health Organization of "Health for all in the year 2000".

The essential goal of primary health care is to place a basic level of health care within the reach of all members of the community, by means acceptable to them, through their own active participation and at a cost that the community and the country can actually afford. It must be an integral part, not only of the country's health system but also of the socioeconomic development plans. Therefore, health activities at all levels should be considered together with other social and economic development activities.

Primary health care is an integral part of the community system, designed, directed and implemented by the members of the community for the purpose of meeting their own requirements without a need for additional or special resources. Consequently, health becomes a way of life in which the community accepts the basic responsibility for achieving and maintaining its own health. The type of facilities, the means and standards for health activities, spring from the socioeconomic conditions of the population itself. These activities by and within the community should include the following areas:

1. Education on the prevailing health problems and the methods for identifying, preventing and controlling them;

2. Promotion of an adequate diet and nutrition and of adequate of drinking water supplies and basic sanitation;

3. Maternal and child health care, including the spacing of pregnancies;

4. Immunization against the most prevalent infectious diseases;

5. Prevention and control of local endemic diseases;

6. Adequate and family treatment of common lesions and diseases;

7. Promotion of mental health;

8. Provision of essential medications.

Nutrition activities under primary health care systems

The importance of proper nutrition in the promotion and maintenance of health is widely recognized today. The nutritional state of the community is a key factor that determines the state of health of its members. Apart from the diseases directly attributable to specific nutritional deficiencies, chronic malnutrition increases susceptibility to many of the nutritional diseases, particularly infectious diseases, and can adversely alter the course of diseases.

The implications of malnutrition for public health go far beyond its important immediate impact in increasing morbidity and mortality among yourng children. There is now reliable evidence indicating that malnutrition at an early age can lead in later years to functional disorders that affect physical performance and productivity and even learning capacity. Malnutrition in adults leads to current diseases and can result in a lessening of physical capacity and productivity. Furthermore, so long as malnutrition continues to be a public health problem, the effectiveness of many health care programs such as immunization and family planning will be lessened. One of the pre-requisites for the promotion of economic development is, beyond a doubt, the prevention and control of malnutrition and the promotion of optimal nutritional status for all of the population.

Though the problem of malnutrition is of worldwide concern, its special importance in the developing countries, where the problem is highly prevalent, must be recognized. It is estimated that in Latin America a million children below age five continue to die each year and that 70% of these premature deaths could be prevented by means of programs with sufficient coverage to prevent malnutrition and communicable diseases. This suggests the existence of widespread problem which it has not yet been possible to bring under control. Some countries have found that the problem of malnutrition in children below age five has increased in the past 10 years, which indicates that the factors responsible for the problem continue to be present and also that action under the health and nutrition problems directed to the target population has not been effective in controling the problem and that new inter-sectoral strategies are required for its solution.

Nutrition research in recent decades has doubtless generated a large amount of valuable knowledge and information that should have served to eliminate at least the severe and obvious forms of malnutrition. The prevention of protein-calorie malnutrition does not necessarily require the formulation and production of special protein-rich mixtures. It is possible to accomplish this goal through a judicious use of low-cost, locally available foods affordable by the poor. Unfortunately, however, the application of all this knowledge acquired through laborious laboratory, clinical and epidemiologic research has lagged behind and there is no demonstrable significant advance in the control and prevention of these diseases. Operations and field research that would have put this knowledge to use has not been promoted and carried out in a vigorous way, so that nutrition programs in general have achieved only partial results. Action-oriented research of the type now proposed to be carried out in various countries of the Region of the Americas is designed to identify and facilitate specific actions in the

field of health that can be implemented within the existing framework of resource, and personnel restrictions.

By means of this program of action-oriented research, a very positive contribution can be made to the eradication of at least the advanced and obvious forms of malnutrition in all the countries of the Region in the coming decade.

It is not regarded as either desirable or feasible to try to conduct nutrition programs in the form of vertical programs. Because of the close relationship between nutrition problems and other community health problems, it is considered that activities in nutrition, family planning, immunization and improvement of environmental sanitation must always go together as mutually-reinforcing components of a comprehensive package of primary health services, particularly maternal and child health services. Even today when it is recognized that nutrition aspects must be an integral component of the primary health care package, the contents of these nutrition components have not been precisely defined, nor has the strategy for putting it into practice. Nutrition activities are therefore a weal link in the primary health chain. Conversely, other components of the primary health package, such as immunization and family planning program have been well-financed activities conducted on a regular basis.

The implementation of a nutrition program involving changes in food practices call for very active community involvement and a deep understanding of the various socio-cultural factors that influence the community's behavior. The strategy for implementing nutrition programs ought to be developed at the level of the community itself, and those responsible for implementation should have not only adequate training but a very sympathetic attitude toward this type of participation.

The importance of defining the content of the nutrition component in realistic and practical terms is a point to be emphasized, as is the importance of taking into consideration in the implementation strategy those socio-cultural factors that influence the community's behavior vis-a-vis of food practices and habits. This means that the field studies to text the validity of the hypotheses which should be formulated from the planning stage, have to be very well designed.

The first level of contact between the individual and the primary health care system should be the primary health workers functioning as an integral part of the health team. The type of health team and primary health worker varies from country to country according to the needs and available resources in each country. A realistic approach to total coverage of the population should be to identify the potential primary health workers in the community who can be quickly trained to perform specific tasks. Thus, it is necessary to understand the abilities of primary health workers to serve in the various components of the primary health care package, including the nutrition component. This makes it essential to determine the type and content of the training to be given to the various members of the health team, which in turn implies a need to perform studies at the community level to serve as a basis in developing guidelines for such training. Due to the lack of a clear

definition of the nutrition component to be included in the primary health care package, and also to inadequate understanding of the most appropriate strategy for conducting such a program at community level, many nutrition programs have been utterly ineffective despite the large investments made in them. This underscores the urgent need to define the nutrition component and establish a clear strategy for implementing it.

Research on the nutrition component in primary health care

Research on the definition and implementation of the nutrition component in primary health care should be the subject of research in the countries of the Region, in order that the action can be geared to the particular circumstances that exist in regard to health problems and to the structure of the services currently being received by the population, especially in rural areas and poor urban areas.

An action-oriented regional program of research in nutrition would include the following objectives:

1. Identify the most effective and feasible actions directed to the improvement of nutrition that can be taken at local level in communities characterized by pronounced socioeconomic restrictions;

2. Determine how and to what extent such actions can be made an integral part of primary health;

3. Determine which of those actions could be included in community development programs, apart from the conventional health systems;

4. Identify the factors at community level that determine differences in the nutritional status of children and poor families living on the same restricted diets and under precarious environmental conditions, so that those factors associated with a better nutrition may be promoted;

5. Develop simple procedures for the identification of the individuals at greatest risk, in order to give them prompt attention, following up on nutrition programs and conducting nutrition surveillance at the community level.

6. Determine strategies for enlisting the community's involvement in nutrition education programs, particularly those designed to bring about an improvement in the nutritional status of mothers and children.

Some types of projects that can be carried out in the countries of the region to achieve these objectives are listed below:

a) Analysis of the present data on the nutrition component in primary health care programs

The general objective of such a project would be to examine the nutrition activities under primary health care systems which are presently operative in

various countries of the Region, in order to identify their positive aspects, limitations and potential, and suggest methods for their improvement. The specific objectives of such a project would be:

1. To evaluate nutrition and nutrition-related activities carried out as part of primary health care to meet the felt needs of the population;

2. To evaluate the performance of primary health workers in terms of coverage, quantity and quality of nutrition services provided to the community;

3. To evaluate existing restraints on the implementation of nutrition activities in the primary health care program;

4. To evaluate the training of primary health workers in terms of nutritional content and subsequent application;

5. To evaluate the existing interaction between the primary health worker and the rest of the health team and the community itself, with emphasis on nutrition activities;

6. To determine how the primary health worker and other members of the health team and members of the community perceive and react to the implementation of nutrition activities in primary health care, the logistical aspects of such activities and the results of such work, as well as to measure the degree of satisfaction with the services rendered;

7. To study the profile of primary health workers and the criteria for their selection;

8. To study the factors responsible for the success or failure of existing programs and suggest appropriate modifications for improving them.

b) Study of the effectiveness and potential of alternative strategies for the development and implementation of nutrition activities in the community

The general objective of such a study would be to identify feasible alternative strategies, apart from the conventional health systems, for implementing nutrition programs in the community or nation-wide. The specific objectives of such a study would be:

1. To take an inventory of existing projects conducted outside the health field that have an extensive infrastructure and could be used to reach the community or that already include nutrition components or offer the possibility of including them;

2. To make a critical analysis of the objectives and activities of such projects;

3. To examine the scope, quality and quantity of nutrition or nutrition-related activities currently being implemented in the project, in the light of the desired minimum nutrition component in the primary health care package;

4. To study the potential of the various development projects in terms of acceptance by and satisfaction of the beneficiaries, as well as their income-generating possibilities;

5. To identify the reasons for their success or failure and recommend changes that can improve the strategy for conducting nutrition activities at community level.

c) Identification of low-cost weaning foods acceptable to poor rural communities and poor urban communities

The general objective of such a project would be to improve the nutrition status of unweaned infants and young children through the development and use of appropriate low-cost weaning foods prepared on the basis of locally available ingredients. The specific objectives would be:

1. To identify the weaning foods currently used in rural and poor urban communities;

2. To evaluate their nutritional quality and improve them if necessary, particularly on the basis of locally available foods;

3. To explore the various factors responsible for the unacceptability of nutritional-adequate weaning foods which have developed in the region;

4. To identify those weaning foods which are appropriate for extensive use in the primary health care system and to promote their consumption.

d) Design and evaluation of community-level nutrition education programs which are relevant and responsive to the community's needs

The general objective of such a project would be to determine the educational contents and methodology best suited for nutrition education activities carried out as part of the primary health care system, in order to make them more effective and more relevant to the health needs of the community. The specific objectives would be:

1. To explore the relevant factors that should be included in nutrition education programs at community levels;

2. To identify that factors that determine the use and non-use or inadequate utilization in the community of weaning or supplemental foods in the feeding of infants;

3. To identify the necessary steps for developing appropriate nutrition education programs best suited for the specific purpose of increasing the acceptance of weaning foods, with reference to the behavioral factors mentioned above;

4. Development and application of the educational technique most appropriate for use at community level;

5. Evaluation of the effectiveness of the above program for nutrition education in the community;

6. To develop guidelines with a view to the preparation of manuals that primary health workers can use to define and orient their nutrition education activities included in the primary health care provided to the population.

e) Development and evaluation of simple procedures by which paramedical personnel and other health volunteers can be used in monitoring food and nutrition at community level

The general objective of the project would be to develop a simple and practical system of nutritional surveillance that can be applied by the primary health care system throughout the country, with special reference to mothers and young children at greatest risk. The specific objectives of the project would be:

1. To identify a series of indicators for use by health workers in the primary health care system. These indicators should serve to determine the severity and magnitude of nutrition problems and monitor them, and should indicate the nutritional conditions for which simple and effective interventions are available for use at individual, family and community level. In addition, these indicators should meet the following tests:

   a. They should be practical, feasible, low in cost and involve the use of readily obtainable measurement equipment;

   b. They must be reliable and reproducible with only small variations by observers;

   c. They must be sensitive to short-term changes;

   d. They must serve as a basis for taking decisions and actions at different levels; and

   e. They must be effective for promoting knowledge, that is, useful for increasing the understanding and awareness of the individual, families and the community concerning problems of nutrition and interventions for combating them.

2. To determine the levels of limits of action that provide optimal sensitivity and specificity for identifying individuals, families and communities at high risk.

3. To develop, test and apply practical measurement tools for use in the field in the nutritional monitoring of selected indicators;

4. To apply and evaluate selected indicators in the context of primary health care programs;

5. To develop simple information feedback systems for use in relating the data obtained from surveillance at individual, family and community levels;

6. To identify, promote and facilitate adequate primary health interventions at the various levels, with emphasis on actions pertaining to individuals, families and communities;

7. To assure complementarity of nutrition surveillance with other information and operational activities of primary health care programs.

f) Comparative study of normal and malnourished children belonging to similar low-income community groups, and identification of the factors that might explain these differences

The general objective of such a project would be to identify factors and determine the nutritional status of children belonging to low-income socio-economic groups in order to use this knowledge in the promotion of a better nutrition through primary health services. The specific objectives of such a project:

1. To determine the extent of protein-calories malnutrition in children of poor urban and rural communities and the proportion of normal children and children with various degrees of malnutrition.

2. To gain a better understanding of the factors contributing to sustained growth and normal nutritional status in a proportion of children exposed to adverse environmental and socioeconomic factors.

3. To delineate the reasons why malnutrition occurs in a mild, moderate, or severe form in children apparently subject to similar environmental tensions.

4. To understand the inter-relation between the intake of food during disease and certain attributes of the mother with the onset of malnutrition in children.

5. To conduct appropriate programs of corrective intervention under the primary health systems.

7. Responsibilities and training of the community health worker or primary health worker

Community health workers are a key element in primary health care. In some communities, especially in rural areas, they represent the initial

contact of an individual or family with the formal health service. They may also be the only members of the community with formal training or acquired skills in health. Their title and level of training varies from country to country. For instance, they may be designated as health promoters, rural health technicians, health volunteers, or by some other title. Whenever possible it is important that they know how to read and write so that they can follow simple written instructions and submit very simple reports. Where this is not possible, some illiterate primary health workers have been given a practical type of training and have managed to perform very well.

Primary health workers are selected from within the community where they live and are expected to work. They may be part-time workers and receive some kind of financial support form the community itself. They may be either men or women, young or old. The importance of age and sex varies according to conditions in a given community; what really counts is that they be mature enough to earn the community's respect and they have the potential ability to learn new things. They should be willing to learn and have good inter-personal relations and the desire to help others. It is essential that they have good contacts within the community and the ability to relate to its people, mothers and children particularly. They should also be able to work with other members of the community. Older women with grown-up children, schoolteachers on early retirement in some countries, medical practitioners, and traditional practical midwives, are some of the types of people best qualified to be trained as community health workers.

The responsibility of the community health worker are many and varied. The workers will be expected to engage in a number of activities described as promotional, preventive, curative and rehabilitational. Most of their time is spent on curative work, which is the greatest need in the community; little time is available for promotional and preventive work, which is precisely where nutrition activities are now included. This, however, should be corrected.

Under the primary health care system, the primary health worker's nutrition activities should be carried out concurrently with other health activities. In the area of prevention and correction of malnutrition the primary health worker should operate in conjunction with other services assisting the community and attending to its needs. These may include governmental and private organizations providing health and other services at local level.

The foregoing suggests the importance of determining very clearly what responsibilities the primary health worker has or should be expected to assume. It also suggests need to plan very carefully an conduct intensive programs specifically aimed at training primary health workers. Such programs should be based on the use of simple manuals designed to guide them in their daily work with the community

Following is a list of some of the points on which the primary health worker should be trained. This listing is based on an actual manual used in training them and guiding their activities with the community. Defining and checking the list of activities to be carried out by the primary health worker and the educational program, contents and techniques to be recommended for their training requires operations research, the findings of which can later be used in improving their level of training to enable them to perform their duties more efficiently and effectively.

1. Knowledge of their own community

This knowledge is important if the worker is to be able to assess the nutritional needs of the community, identify groups at greatest risk, identify nutrition problems so as to take the necessaty corrective actions, learn to work with the people, and decide when cases should be referred to higher levels of the health structure.

2. Evaluation and monitoring of health and nutrition in children

It is very important that the primary health worker understand the relations among nutrition, growth and development; learn to identify the age of a child, to accurately weigh the child and to work with the growth curves on which the nutritional evaluation is based, recording the weight correctly, interpreting the growth curves, and determining the nutritional state of children.

3. Breast-feeding

The primary health worker should find out how the mothers in the community are feeding their unweaned children, should know the advantages and practical details of breast-feeding in order to be able to give advice on how to solve problems arising in this regard and on the dangers involved in using a nursing bottle and how to feed when the mother does not have enough milk.

4. Food supplements and feeding of young children

The primary health worker should find out how the mothers are feeding the young children and acquaint themselves with the mother's habits, beliefs and practices in regard to the relationship between diet and health. They should know which of the locally available foods and mixtures provide the best nutrition for the feeding of young children and be acquainted with and able to recommend a scheme for the feeding of children at various ages.

5. Diet and nutrition of mothers

The primary health worker should be acquainted with beliefs and practices concerning pregnancy and lactation, specifically with the diet of mothers during these periods, and should also understand the effect that malnutrition in a pregnant woman can have on the newborn child, as well as the importance of sound nutrition for a lactating mother; the worker should be able to recommend appropriate diets for periods of pregnancy and lactation.

6. Identification, handling and prevention of nutritional deficiencies

The primary health worker should be able to recognize the principal nutritional deficiencies, particularly protein-calories malnutrition, and

have a clear understanding of their causes and the synergic relationship among its various determining factors. The worker should also be able to identify the children at greatest risk and handle cases of malnourished children and those at risk of malnutrition, as well as identify anemic children and mothers and carrry out prevention and treatment of such cases.

7. Diarrhea and nutrition

The primary health worker should clearly understand the causes and consequences of diarrheal disease, and be able to identify children suffering from dehydration and judge the severity of the diarrhea or dehydration in order to recommend treatment in the home or at a higher level of the health structure. He or she must be able to provide counseling on a proper diet during and after attacks of diarrhea and to seek or promote the participation of parents and the community at large in activities for the prevention and treatment of diarrhea and dehydration in young children.

8. Nutrition and infection

The primary health worker must have an understanding of the defenses of the organisms against infection and the synergic relationship between malnutrition and infectious diseases. The worker must also be able to treat infectious diseases and prevent and control them, especially through basic rural sanitation activities and immunization programs.

9. Motivation and planning for action

The primary health worker must be able to develop very good working relations, to identify those persons who can collaborate in the health programs, and to create in the population an increasing interest and a desire to improve their health and nutrition, particularly the diet of mothers and children in the community. He or she must have the ability to teach persuasively how to organize groups, how to work as part of a team with other people in the community and must become a genuine leader, teaching, training and supervising community volunteer groups in health activities, specifically nutrition, within the framework of the existing restrictions in each locality.

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Washington, April 30, 1980

Report of the Programme Advisory Group for the ACTION-ORIENTED RESEARCH AND DEVELOPMENT PROGRAMME IN NUTRITION

Geneva
30 October - 1 November 1979

CONTENTS

I. THE ACTION-ORIENTED RESEARCH AND DEVELOPMENT PROGRAMME IN NUTRITION

It is proposed that the World Health Organization, with the aid of external funding, establish a special research programme that focuses upon nutrition and is responsive to the true needs observed at the community level.

The underlying objective of the Action-Oriented Research and Development Programme in Nutrition is to accelerate the development of more effective actions to ameliorate and control malnutrition in developing countries.

This should be accomplished by:

1. Identifying, on a continuing basis, the problems and needs at the community level.
2. Translating these problems into identifiable research questions.
3. Establishing priorities for areas of research on the most pressing needs, and continuing to review these priorities.
4. Promoting the research to address these questions.
5. Translating findings into approaches that can be implemented at the community level.
6. Promoting research on the implementation of these approaches.

In this process, the Prog. mm should be:

1. Continually responsive to the actual and changing needs of the community.
2. Responsive to the need to develop the institutional resources required to undertake and interpret research.
3. Supportive of WHO as an agency that addresses the advisory needs of developing countries.

The initial research priority of this Programme should be directed to the infant and child 0 to 30 months of age. This research effort should seek opportunities to improve food intake within locally available resources and seek operational steps to take advantage of these opportunities.

The Programme also makes provision for the pursuit of innovative research in areas outside the initial research priority, and it makes limited provision for the pursuit of existing research areas.

A special Action-Oriented Research and Development Programme in Nutrition is proposed because some areas that are very important to effective primary health care are not now being pursued by other agencies. There is both need and opportunity for leadership.

II. BACKGROUND

Malnutrition is now widely accepted as an important impediment to health and well-being. The etiology of malnutrition is interwoven with the many facets of poverty and underdevelopment; thus, the ultimate solutions to nutritional problems will be associated with overall economic and social development. However, it is also recognized that an improvement in the existing nutrition situation in many areas of the world need not, and must not, wait for long-term development. Further, experience has shown that economic development by itself does not necessarily bring improvements in nutritional conditions. Better nutrition can and should be an integral part of general development, but action targeted for nutrition should be taken within existing conditions.

Activities undertaken by WHO and others have already demonstrated that specific nutritional deficiency diseases are amenable to change. Important progress toward their control has been made within the constraints of existing socioeconomic conditions. Relatively less progress has been made in attacking the general problem of undernutrition, in which the overall intake of food, rather than of specific nutrients, is inadequate or inappropriate.

The health sector represented by WHO must continue to contribute to the amelioration of nutritional problems by combatting specific infecious and nutritional diseases and by improving community-level health activities. In cooperation with other sectors and other agencies, it must work to ensure that these goals are embodied in balanced development activities.

Within this framework, the Nutrition Unit of WHO is responsible for providing relevant technical information on a wide range of nutrition topics. This includes promoting and financially supporting the development of needed information, making this information available to all levels of government, and, most importantly, working with other units and programmes of WHO and other groups in assessing and planning integrated approaches to improve and maintain health.

Taking into consideration advice from many sectors—from those familiar with community needs in the primary health-care system as well as from those familiar with existing knowledge, resources, and research possibilities, the Nutrition Unit has examined carefully the strengths and weaknesses of its own capabilities, and indeed of the nutrition community in general, for meeting the problems and issues of today.

These analyses gave rise to a proposal for a special research programme designed to overcome the problems that were identified as limiting the design and implementation of action programmes at the community level and in response to community needs.

The general outlines of this programme were presented to the ACMR (ACMR 20/78.7) in June 1978, which responded immediately with approval in principle. Further suggestion about the possible nature of the programme were made by the ACMR Subcommittee on Nutrition (ACMR/NUT.1/79.1). The proposals were then sent to the Regional offices for discussion, comment, and advice. Reports were received from SEARO (SEA/NUT/70), from AFRO, and from AMRO (EM/4th MTG. ACMR/15), after distribution to and discussion by country representatives. A further consultation report on the specific area of nutrition

and host resistance (NUT/79.20) was obtained in response to a recommendation from the ACMR Subcommittee on Nutrition.

All of these reports, reflecting the judgements of many institutions, countries, and individuals familiar with the community-level needs throughout the developing world, gave strong support to an innovative approach to research programmes. Such an approach would focus on nutritional questions, be based on a clear understanding of needs at the community level, and offer a strong possibility of leading quickly to action. The reports also suggested other areas of research, the development of new areas and new aspects of previously recognized research, and some continuation of existing activities.

This proposal represents a synthesis of these many reports. The Advisory Group has developed a set of principles that should become the basis for a new WHO Action-Oriented Research and Development Programme in Nutrition, and has made recommendations on the initial priorities and nature of the special programme.

The Advisory Group emphasizes that the recommendations relate to the research needs that will support the nutritional component of primary health care and, particularly, the actions required to improve dietary intake. The recommendations do not address the full scope of primary health care, although it is clear that many non-nutritional activities of primary health care are required for nutritional improvement. The Advisory Group also recognizes that scientific knowledge and practical know-how are adequate for many nutrition programmes and that WHO must continue to foster such programmes. Thus, the recommendations are directed specifically to the gaps in information needed to take action on problems that now are not being addressed properly or that require new approaches.

III. PROGRAMME PRINCIPLES

The principles underlying the design and implementation of the Action-Oriented Research and Development Programme in Nutrition are set forth both as an explanation of the Advisory Group's recommendations for initial priorities and as a guideline for the evolution of the Programme.

*** The Programme should be responsive to actual needs at the community level, which means that the Programme design should provide mechanisms to assess these needs. For instance, a need may be identified as a stumbling block encountered by those working in the community. Such needs should be translated into questions that can be addressed by research and in a manner that leads to results relevant to community action. The Programme should also recognize institutional needs and opportunities that permit the identification, conduct, and interpretation of necessary and relevant research.

*** The Programme should recognize and work within the complexity of the problem of malnutrition. It should address the nutritional component, primarily that relating to dietary intake, rather than the total complex of factors that affect malnutrition. Other programmes will address different aspects of the problem, such as the control of infectious disease, and many complementary actions will be integrated in the operation of the primary health-care system. The Programme's research should be conducted in such a manner that its results are relevant to actual and planned primary health-care activities.

*** The Programme should address the overall problem of undernutrition. This takes into account the control of specific nutritional deficiency diseases but does not focus upon them in isolation.

*** The Programme should be aimed at actions that are needed at the community level. This implies a much greater concern with preventive than with curative measures, with the promotion of adequate nutrition rather than with the cure of nutritional disease.

*** The Programme should examine the possibilities and techniques of using local resources as much as possible to relieve local problems. These resources include previous research findings and potential national and local resources as well as the physical resources. The research should address the matter of self-help and self-reliance. At the same time, the research should be able to identify situations in which local resources may not suffice. In either case, it should specify constraints to using the resources available within or to the community and develop approaches to relieve these constraints.

*** The Programme should aim to develop generalizations and principles that may be used to diagnose situations obtaining in particular ecological and socio-economic settings and to predict the type of action appropriate to that situation. This may call for coordinated cross-cultural and cross-ecological approaches to certain questions.

*** The Programme should give emphasis to those areas of activity and those problems in which the need seems greatest. At this time, this would mandate a major focus upon the problem of inadequate nutrition for infants and young children during weaning and postweaning.

*** The Programme should involve those who will use the results of the research in the design of the research. This widens the scope of research in the Programme from "Why does a detected problem exist?" to "How can it be relieved?" and, equally important, "How can this new understanding be transferred back to

the user and be translated into action?" The Programme should cover knowledge-generating research and operational research. The operational research should be concerned with the identification of techniques and technologies that are most likely to be beneficial in the particular operational setting, as well as with the transfer of these techniques and technologies from the research setting to other settings.

*** The Programme design should take into account the research and development activities in other programmes of WHO and elsewhere, so that its activities complement and are not redundant with other activities. This implies the need for a review process that will harmonize activities across the special programmes of WHO and among international and national agencies.

*** Although the Action-Oriented Research and Development Programme in Nutrition is devoted to research and will require its own administrative structure, its goal in gathering information is to facilitate operational programmes. It must be considered complementary to the advisory role of WHO and the Nutrition Unit. Thus, there should be a close relationship between Programme staff and Nutrition Unit staff, and a continuing flow of information extending across central staff, Regional Offices, national governments, and field workers.

IV. INITIAL EMPHASES OF THE RESEARCH PROGRAMME

On the basis of the foregoing principles, the Advisory Group recommends three initial emphases in research priorities. This judgement is based on a collective review of comments from the ACMR Subcommittee on Nutrition, the regional offices, the consultation report on nutrition and host resistance, and the Advisory Group's assessment of progress that could be made through research and of opportunities to conduct, interpret, and apply the research.

Priority 1. Self-Reliance in Child Feeding

Priority 2. Research toward Innovative Objectives

Priority 3. Research toward Established Objectives

The priority rankings should serve as an initial guide to the allocation of Programme resources and effort. It is difficult to suggest a precise distribution of resources without clear knowledge of the available budget; however, it should be stressed that the Advisory Group assigns a very high priority to the first area, including the development of institutional resources and capabilities to conduct such research. If funds are short, self-reliance in child feeding might warrant status as sole priority. In a stable and reasonable funding situation, this area might warrant most of the available resources, and research toward innovative objectives might receive the greater share of the remaining allocation. The priority ranking reflects not only a judgement of the relative importance, and cost, of the areas of research, but of the potential for support from other sources as well.

In Priority Area 1, a substantial part of the initial resources may be allocated to institutional development and research planning. This may be expected to decrease in proportion to operating research funds in later years. In contrast, major institutional capacity already exists for Priority Area 3. Here, virtually all of the allocation might be directed to the operating costs of the actual research from the beginning.

It seems clear that a major function within the Programme will be to monitor continuously the needs for research and the productivity and applicability of the research funded in the various areas. It may be necessary to redefine priority areas and reallocate resources as both the budget and the research needs evolve.

Priority 1. Self-Reliance in Child Feeding

Nutritional problems in the developing world are not limited by any age barriers. Yet the terrible effects of undernutrition and malnutrition—the multitude of nutritional disorders, protein-energy malnutrition, blindness, retarded physical and mental growth - and the enormous detrimental impact of these problems in the developing countries, make it imperative that the children receive the highest priority.

The early childhood period from birth to about three years of age has been established as the most vulnerable. Although much effort has gone into the problem of early childhood malnutrition in developing countries, it appears to have had no visible impact. There is no dearth of information on the effects of malnutrition on children, or even on some of the major causes. Yet, there

are gaps in our knowledge of causal relationships, not with regard to inadequate intake of food or of specific items and its clinical manifestations, but in regard to the causes of inadequate intake itself, including food availability.

This clearly indicates the need to look at the problem of malnutrition from a new perspective, one that will improve the problem of food intake rather than dealing with its ill effects. This search has to be made in the community, where a closer look at the child-feeding patterns may yield valuable information. In addition, more emphasis must be laid on research to identify the potential for nutritional self-help and self-care that exists within the community. This research must also have roots in the community. It begins with the people and ends with the people.

The research has to look for answers that can largely be implemented by the people themselves and under present socioeconomic conditions. This casts a greater responsibility on the researcher, who must not only analyze the problem, but also look for answers within and as an integrated part of community development and primary health care.

Such a task requires an active search for positive factors in the community which hold promise for solutions to problems. Some of these factors are already in operation, to varying degrees, among some families, since malnutrition is not ubiquitous among poor families. Thus, research has to identify these factors and investigate methods of feeding this knowledge back to the community. Research that places major emphasis on discovering ways to increase community self-reliance and self-help, and that builds in a special component of follow-up action based on community resources and efforts, should receive the highest priority in the Programme.

The need to identify community potential for self-development is gaining more and more recognition. Nutrition has to be viewed as an integral component of such a development program. Nutrition research that aims to promote self-reliant, community-based child-feeding programmes is an important step in this direction.

The high-priority research toward self-reliance in child feeding would:

1. Center on the needs and problems of children from birth to about 30 months of age, within the family and community setting;
2. Address the problem of general undernutrition rather than specific deficiency diseases, and concentrate on prevention rather than treatment; and
3. Focus on the causes and prevention of inadequate quantity or quality of food intake among infants and young children.

The conceptual sequence of questions directed to this priority area should cover the following:

1. Why is existing food intake inadequate? This question addresses the spectrum of variables that may influence feeding practices and food intake. They include both biological factors such as the anorexigenic effects of infection, and social factors such as maternal beliefs and attitudes about feeding, choice of foods, and habits of intrafamilial food distribution. The research is of a behavioural nature: What are the determinants of observed behaviour? Clues may be obtained by comparing the feeding patterns of well-nourished and poorly-nourished children from similar families.

This question presupposes that there are strong indications of inadequate food intake and that the nature of this inadequacy is understood.

What types of change would be expected to modify existing practices and improve food intake? Because the first question is phrased as the basis for mediating action, the hypotheses it generates may then be tested in the community. Changes that warrant special attention are those that might be achieved within local resources. If the postulate is confirmed, the next question might be:

How can these changes be effected within the community? This would involve the appropriate operational research. A final and important question subject to research would be:

How can the knowledge gained in this investigation and the experience gained from acting on the problem be adapted and applied in other settings? This question addresses the transfer of culturally and socioeconomically relevant technology. The research should be designed to investigate some general principles important to the underlying problem and its solution, so that they could be extrapolated for use in other settings.

These questions illustrate a continuum of interest; they do not describe any particular methodology or design. The needs, opportunities, and desirable design will arise from each particular setting and the knowledge already available. However, it is important that investigators have a clear understanding of the final questions. Attention to the full purpose of the Action-Oriented Research and Development Programme in Nutrition should be given a high priority in assessing the merit of a particular proposal.

It is also important that the researchers recognize how the immediate task of improving food intake fits into the ultimate goal of improving the health of children. Other actions that affect children's health, such as the control of infectious disease, should be taken into account in the design of the research. Although a research project within the Programme is directed to only one component of health care, it may include collaborate research in order to develop an integrated approach to health care.

The expected outcomes of a programme of research of this type might be:

1. Generalizable principles about determinants of food intake in different ecological, cultural, and economic settings, which may be used to design the nutrition component of integrated health-care and development programmes.
2. "Instruments" or "techniques" that may be used by health and community workers to "diagnose" the nature of specific situations and thereby predict and plan the types of actions that would be beneficial and applicable in improving food intake.
3. In particular, guidance as to the extent to which such changes may be effected within the primary health-care setting and with existing resources.

Although the primary objective of the Programme looks for actions that might be taken within primary health care and with local resources, the research may nonetheless identify situations in which these are inadequate to bring about the needed improvement. In this instance, the Programme will provide information on how new resources could be developed or how existing structures could be improved or adapted.

Priority 2. Research toward Innovative Objectives

No research planning committee, no matter how it is composed, is likely to be able to identify all possibilities for innovative approaches to long-standing problems. Therefore, the Advisory Group recommends that the Action-Oriented Research and Development Programme in Nutrition be responsive to truly innovative ideas that seem appropriate, relevant, and feasible for implementation. This is not meant to imply support of different approaches to old objectives. Rather, the Programme should search out and encourage innovative concepts about problems in the community, and research designs that approach these new objectives with the aim of developing appropriate action programmes.

Research in human nutrition has generally concentrated on the more conventional information about fairly evident problems. Often the search is intended to meet specific needs for particular programmes. The results sought may not be fully relevant to public-health priorities or to primary health care. When such findings are implemented, results are often disappointing. One of the reasons for such ineffectiveness could be that the presenting problem may have masked some underlying problem that did not receive equal consideration in the research.

Because nutrition is a vastly complex subject with many ramifications in other disciplines, seeking the traditional answers to traditional questions through traditional research may not yield adequate information for taking comprehensive and effective action. This may especially be true in an area such as child feeding, where the most important information lies within the family or community structure.

In action-oriented research, it is important to seek relevant answers to relevant questions. This demands innovative approaches to applied research. Besides examining the problem, the research may need to raise, or even search out and identify, other questions. It may require innovative research design. It may involve new kinds of participants, especially family and community members. This research calls for a high level of competence and a fair degree of willingness to adapt and modify.

Priority 3. Research toward Established Objectives

The need to support on-going research directed toward well-established objectives in the field of nutrition also has received careful attention. Such research receives a lower priority rating in the Programme because there are other sources of support. In making selections among the many applications that may come forward in this area, the Advisory Group recommends that attention be directed both to the specific need for research in the particular area and to the relevance of the specific proposal to this need. Scientific quality can be a major criterion in choosing among competing applications.

A number of areas of potential research, most reflecting existing research interests, have been brought to the attention of the Advisory Group. Those listed below are examples of research areas for which funds may be requested; the list implies no relative priority.

Agricultural and socioeconomic factors in the causation of malnutrition.

Breastfeeding: trends; causes for its decline; measures for its preservation and promotion.

Diarrhoeal disease and malnutrition: nutritional effects of oral rehydration; oral rehydration using common home beverages.

Endemic goitre control with iodized oil in highly endemic areas.

Interaction of nutrition and host resistance against pathogens.

Nutritional anaemias: effects of iron and folic acid supplementation during pregnancy on birth weight; effects of supplementation in p. falciparum endemic areas; efficacy of fortification of common salt with iron; development of indices to identify pregnant women at risk.

Nutritional emergencies: management of nutritional diseases during national emergencies.

Nutritional surveillance: development of simple procedures for use in food and nutritional surveillance, for evaluation of programmes, and for the identification of groups "at risk."

Parasitic infestation: its effect on protein-energy malnutrition and hypovitaminosis A; the effect of periodic deworming on nutritional status and growth.

Protein and energy requirements.

Protein-energy malnutrition: alternative approaches to treatment and prevention.

Vitamin A deficiency: evaluations of the relative cost-effectiveness of periodic administration of massive doses and of food fortification; impact of massive doses of vitamin A on nutritional blindness.

Weaning foods: development of suitable weaning recipes based on inexpensive locally available foods; practical problems in their promotion and approaches to overcome them; methods for reducing bulk.

V. SOME MANAGEMENT PRINCIPLES

The final organizational structure of the Action-Oriented Research and Development Programme in Nutrition will be determined by the Programme organizers and operating body, but to illustrate the operation of the Programme, the Advisory Group has envisaged a structure with four major administrative elements.

Body	Responsibilities
Programme Board	Provide overall responsibility for strategic planning, definition of priorities, and budget allocation. Fiscal, scientific, and professional responsibility.
Project Review Board	Provide independent assessment of the scientific quality, relevance, and appropriateness of specific projects. Make recommendations to the Programme Board.
Task Force	Provide expert advice and assistance in the definition of specific interest areas (e.g., preparation of requests for research proposals); assistance in the development of research proposals in these areas and in the identification of opportunities for research and for the development of required institutional strength.
Programme Director	Provide scientific and administrative leadership in the operation of the Programme.
Programme Staff (working closely with WHO staff)	Provide assistance in research and institutional development. These are very time-consuming tasks that cannot be fulfilled by WHO staff without jeapardizing their role and advisory mission. The staff should be seen as part of the goal of the Programme and not as "overhead costs."

Taking this organizational plan into consideration, the Advisory Group has deemed seven principles of programme management as important if the Programme is to function in the manner intended.

A. Responsiveness

The overriding principle of this research programme is that it be responsive to the member countries' needs for information to improve nutrition.

1. Responsiveness in setting research priorities. The Programme should be overseen by a Programme Board composed of member countries whose research needs must be met, by member countries who contribute to the Programme, by representatives of concerned agencies, and by scientists selected ad personam for their scientific competence. The Board should assign priorities to areas of research and review and adjust priorities as more information is gained. It would approve research to be undertaken as recommended by the Project Review Board. This approval process assures the oversight of priorities.

2. Responsiveness to practical questions that must be addressed by research.

Research proposals from investigators. A scientist may have identified a question relevant to the objective of the Programme, and present a complete research proposal. The Programme should review all such proposals for relevance to Programme objectives, appropriateness to the setting in which the results will be applied, and scientific quality. The Research Review Board should be composed of experts in public health and nutrition, with an even distribution between scientists and practical public-health experts, who are neither requesting funds nor associated with persons or institutions requesting funds and who have not participated in preparing the proposals as members of

the Task Force. Both Task Force members and Programme staff may work with investigators in developing and improving their proposals.

Questions generated in communities and primary health-care settings. Public-health nutrition administrators and workers and community members concerned about nutrition often identify problems needing research but may not have designed a complete research design. These problems may go unresolved because scientists either are unaware of the questions or do not understand them. The Programme should help to identify these questions, translate them so that scientists can understand them, and foster research to answer them by assisting local scientists. This may include technical assistance in design and planning, provision of special techniques necessary for the study, or identification and support of consultants or co-investigators. This activity should be a part of the responsibility of the Task Force and Programme staff and the central and regional staff of WHO.

There are many gradations between the identification of a question without any research design and the formulation of a complete research proposal. The Programme should provide assistance whenever a relevant and appropriate question arises for which scientific expertise in research design and implementation is required.

B. Relevance

The relevance and appropriateness of proposed research should be judged by experts on the Review Board who are aware of the operational needs to which the results of the research will be applied.

Research results are only relevant when they are applied, so relevance is best assured by including in the research team an individual who is eager to see that the results are implemented in nutrition activities. This individual must participate in the research design as well, to ensure that the results can be translated into new, effective nutrition activities.

Projects that fail to take existing research and other activities into account run the risk of duplicating efforts and of being irrelevant to current and potential problems. Thus, research proposals should describe the setting in which the results are to be applied and include an appropriate design to deliver the results. Through its membership and from information gathered by WHO, the Programme should periodically ascertain the relevance of the priorities of the research areas, to be sure that the Programme is emphasizing the knowledge gaps that impede adequate nutrition. The Programme Board should make a serious and continuing effort to harmonize its own activities with those of other WHO programmes and other agencies.

The broader the relevance of the potential findings, the higher the priority of the research. Where the findings are relevant to many situations and circumstances, the WHO Nutrition Unit and regional staff should be responsible for disseminating the information, and WHO should foster the consideration and implementation of these findings through its global, regional, and national resources.

C. Scientific Quality

Experience has shown that certain ways of designing and conducting research are more likely than others to lead to reproducible results and thus to useful

predictions of effects. These features are major determinants of the quality of research. Good quality is not synonymous with high cost and sophistication.

Scientists consistently are able to agree on the quality of proposed research in their own areas or in similar fields, even though each may approach the same research objectives or questions in a different fashion or may offer a different assessment of the relevance of the objectives. This makes it possible for the Programme to subject all research proposals it receives to scientists on the Review Board for a judgement on quality of design and methodology. If the Review Board judges the relevance and appropriateness to be good but the quality is inadequate, they may advise the Task Force to assist the investigators in strengthening their capabilities and design.

D. Integrity

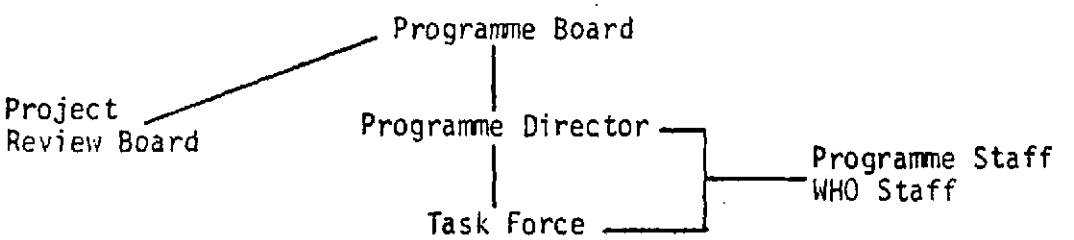
Integrity of judgement is only assured when there is no conflict of interest. The Review Board should have no interest in a proposal other than to judge its relevance, appropriateness, and quality. The Review Board should be independent of the Task Force and of the Programme and WHO staff members, who, to accomplish their job, must foster research proposals and sometimes participate in the design of the proposals coming forward for review.

E. Professional, Scientific, and Fiscal Responsibility

The Programme Board carries final responsibility to the donors, to WHO, and to the world community for the wise and appropriate use of its financial and other resources. The structures of the Programme should be designed to support and monitor this responsibility.

F. Simplicity

1. Management Structure. The administrative structure of the Programme should be as simple as possible and still meet the management principles that have been enumerated. One possible initial structure is as follows:



One very important element which is not visible in this diagram is the flow of ideas and research proposals from the community, from the primary health-care workers, and from others concerned with improving community nutrition.

Although simplicity of structure and procedure should be a continuing policy, they should not be allowed to compromise either the integrity or the effectiveness of the Programme in fulfilling its responsibilities. The following two examples illustrate how the structure might function.

2. Management of a Research Proposal. When an unsolicited (investigator-generated) proposal is received, it would normally be referred to the Task Force for consideration. If the proposal is apparently relevant but shows opportunity for improvement, the Task Force and Programme Staff may offer their direct assistance, consultant services, or other help. The proposal would be revised and would be considered again by the Task Force.

Proposals thought to be appropriate for funding by the Task Force, as well as projects deemed inappropriate, should be referred to the Project Review Board. Projects also should reach the Project Review Board at the

request of the applicant, regardless of the judgement of the Task Force. The Review Board should offer independent judgement of the proposal's relevance, appropriateness, and scientific quality and make a report to the Programme Board of either approval for funding (with relative ranking of priority), deferral for improvement, or disapproval for funding. The Programme Board, taking these recommendations into account, as well as the available distribution of resources across Programme priority areas and the strength of competing applications, should make the final decision on the disposition of the application.

It would be expected that in most cases in which projects judged strong in relevance and potential are deferred, priority would be given to institutional strengthening or other assistance, such as planning grants.

3. Institutional Strengthening. When needs for useful research arise from community or health-care settings, the Programme should direct assistance to strengthening institutional capacity to conduct quality research. The Programme should focus its resources on supporting institutions, fostering independent competence in local researchers, and providing on-the-job training with WHO staff, consultants, or, if appropriate, co-investigators. Research planning grants may be another method of developing stronger research proposals and developing local capabilities. Such grants should be made available on the basis of favourable review of a plan of research and use of the planning grant. All research proposals should be reviewed for their potential to promote institutional development.

Because the Programme intends to promote and develop institutional strength in the priority areas of research, it should support activities that will maintain and reinforce this research capacity. This should include fostering

communication among investigators and, as appropriate, lending partial support to workshops, seminars, and visiting scientists. In these activities, collaboration with regional offices of WHO, which share the goals of the Programme, would seem logical.

G. Flexibility

What is appropriate today may not be so tomorrow. This applies to programme objectives, priorities, and management. The Programme Board should continually review its objectives and priorities on the basis of members' knowledge, the kinds of proposals being submitted, and other information. The Programme provides flexibility by fostering and responding to initiatives from those who have to address the problems of malnutrition in their communities and in their work.

ANNEX I

Programme Advisory Panel for the

Action-Oriented Research and Development Programme in Nutrition

Geneva, 30 October - 1 November 1979

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