
PART III

Chapter 12

**MATERNAL AND CHILD
NUTRITION**

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I. Nutritional Situation of Mothers and Children

The nutritional situation of the population is determined by a variety of social, economic, and political factors that influence the availability of food and dietary intake of individuals. The principal nutrition problems of women and children continue to be protein-energy malnutrition, especially in children, and deficiencies of certain specific micronutrients (nutrients that are needed in small amounts), such as vitamin A, iodine, and iron. The latter deficiency occurs mainly in women of childbearing age and in small children.

1. Protein-energy malnutrition

Protein-energy malnutrition affects the growth pattern of children. The presence of this form of malnutrition is determined by using certain anthropometric indicators (weight and height, among others). Data on these indicators are collected through surveys or obtained from food and nutrition surveillance systems. They are based fundamentally on information from health centers, where children are generally weighed and measured when they are attended in the services.

Birthweight depends basically on two factors: duration of pregnancy and intrauterine growth. These factors, in turn, are closely linked to the nutritional status of the mother, which is an indicator of the future growth and development of the child. The World Health Organization (WHO) has defined "low birthweight" as a weight at birth of under 2,500 g.

Although children born in hospitals are generally weighed, this information is not always reported on a regular and timely basis. When births occur outside of health institutions, the reported weight is often not reliable. In addition, in information from the countries, the origin and representativity of the data are frequently not specified.

The highest rates of low birthweight in America Latin have been reported in Ecuador (15.0%), Nicaragua (15.0%), Guatemala (14.0%), Bolivia, and the Dominican Republic (12.0%). At the other end of the spectrum, of the countries for which the most recent information is available, those that report the lowest rates are Chile (5.7%), Costa Rica (6.0%) and Mexico (6.5%).

It should be emphasized that there are marked regional differences in almost all the countries. For example, although the national average in Bolivia is 12%, this proportion varies from 5% in Cochabamba to 14%-17% in La Paz (1).

Until the late 1970s, the Gómez classification was the most widely used method in Latin America for determining the nutritional status of children under 5 years of age based on the indicator weight-for-age. As a reference standard for this classification, the Harvard growth curves—derived essentially from observations of children in the city of Boston between 1930 and 1956—were used.

The main contribution of the Gómez method was to standardize the classification of malnutrition, using well-defined cutoff points that were eventually adopted almost worldwide. However, the cutoff points used tended to overestimate malnutrition. They were based on clinical experiences of survival and recovery of malnourished children who were hospitalized (2).

Recognizing the problems of representativity associated with the reference standards and the cutoff points used in the Gómez classification, in 1978 WHO recommended the use of the growth curves developed by the United States National Center for Health Statistics (NCHS) and those

developed by the Centers for Disease Prevention and Control (CDC), based on the HANES health surveys and those of the Fels Research Institute. These were the curves that most closely met the criteria of WHO.

It was recommended that standard deviations from the median reference value be used as cutoff points because they would reflect the distribution of the reference values. As an anthropometric criterion for the diagnosis of malnutrition, it was recommended that -2 standard deviations (-2 SD) be used (3, 4). Values below this cutoff point are classified as moderate and severe malnutrition (5). However, this classification has not been adopted by all countries.

According to the available data, the prevalence of malnutrition in the Region ranges from 0.8% in Chile (according to the Sempé Classification, with a cutoff point of approximately 75% of the median), to 38.5% in Guatemala (WHO Classification, cutoff point of -2SD) (6). Based on these figures and on projections of the under-5 population in the Region, it can be estimated that approximately 12% of children in this age group are malnourished. This means that more than 7 million children in Latin America suffer from moderate or severe malnutrition.

The classification recommended by WHO is also used to determine whether a height-for-age or weight-for-age deficit exists. A height-for-age deficit, for example, indicates stunted growth. Children with this deficit are often said to be suffering from "chronic malnutrition."

This term, however, is not satisfactory, since it suggests a continuous process or one that is ongoing at the moment of observation. Nevertheless, the process may have taken place in the past, and recovery may not have occurred or may not have been completed at the time of the exam. The highest prevalence of height deficit is found in Guatemala, Bolivia, Peru, Ecuador and Brazil, where at least one out of every three children show stunting (6).

Low weight-for-height or "acute malnutrition," indicates a deficit of body tissue and fat in relation to the expected values for a child of the same height. It has been asserted this indicator is more sensitive to changes in food intake than those described above, but this is controversial, since several studies in Central America have demonstrated that the anthropometric indicator that is affected the earliest is weight-for-age, although it is not used as often to classify the degree of malnutrition.

The prevalence of weight-for-height deficits is high in periods of famine, which are infrequent in Latin America and the Caribbean. This explains why the rates of "acute malnutrition," are relatively low, ranging from 0.4% to 7.2%, the average for the region being 2% to 3% (6). This indicator would not appear to be the most suitable for studies of populations; rather, it is more appropriate for monitoring individual growth and development.

In general, it can be concluded that most malnutrition in Latin America is the result of a slow process of undernutrition associated with other environmental factors such as the prevalence of infections and lack of access to health services. Less frequently, there are episodes of acute malnutrition due to acute infectious processes, which increase nutrient requirements, or due to an abrupt and severe shortage of food, as happens in Africa or Asia as a result of prolonged drought or war.

In recent years height surveys have been conducted among children in the first year of primary school (generally between 6 and 9 years of age). Although height-for-age does not reflect present nutritional status, it is a good indicator of the child's nutritional, socioeconomic, and general health history. One advantage of such height surveys is that the coverage of the school system in most of countries is greater than that of health services (7).

The prevalence of height deficits is highest in Honduras (39.8%), Guatemala (37.4%), and Ecuador (37.1%). The lowest rates are observed in Uruguay (4.0%). As in the case of preschoolers, malnutrition among schoolchildren is the result of prolonged inadequate diet. This indicator is related, to a greater or lesser extent, to other socioeconomic indicators (6).

When it has been possible to compare malnutrition rates over time, a downward trend has been noted in almost all the countries of the region. However, in some countries, such as Guatemala and Panama, malnutrition rates have increased, while in others, such as Ecuador and El Salvador, very slight decreases have been registered in comparison with the absolute growth of the population.

It should also be borne in mind that when the prevalence of malnutrition reaches low levels, marked decreases cannot be expected. In the case of the indicator height-for-age, for example, change occurs very slowly and takes years to become apparent.

The improvement in nutritional status might be attributed to the relative increase in the availability of energy in the countries, although negative rates of change have been reported with regard to energy availability in many countries.

It might also be attributed to vigorous efforts over the past 80 years to promote breastfeeding, appropriate weaning practices, adequate feeding during episodes of acute illness, immunization programs, control of diarrheal and respiratory diseases, and the expansion of basic sanitation coverage.

It would be a mistake to assume an attitude of complacency in the face of this situation. In some countries, the maximum benefit probably has already been achieved, or will soon have been achieved, from the application of the aforementioned strategies.

In countries in which malnutrition has been reduced to moderate levels, there are still some geographic areas where the prevalence of low weight-for-age exceeds the national levels of the countries with the highest rates. To identify these areas, it is necessary have sufficiently disaggregated information, which nutrition surveys do not generally provide. Only nutritional surveillance systems at the operational level can provide the data needed to identify depressed areas and target interventions accordingly.

2. Micronutrient deficiencies

Micronutrients are nutrients that are needed by the body in very small amounts. The most common micronutrient deficiencies in Latin America are those of iron, iodine, and vitamin A. It is difficult to draw comparisons between countries because several different indicators are used to assess deficiencies of these micronutrients.

2.1 Iron deficiency anemia

Iron deficiency may be caused by inadequate dietary intake, excessive loss, or increased requirements. The first cause, which results in nutritional anemia, seems to be most frequent.

Iron deficiency has functional repercussions on mental, endocrine, and immune capacity and physical stamina. During pregnancy, it is also associated with low birthweight.

The data that exist on the prevalence of iron deficiency anemia in the region come, in most cases, from limited studies that are not representative of the national situation or from information supplied by health services. In addition, because the observations are carried out in different time periods, comparison is difficult.

According to WHO criteria, the cutoff point below which anemia can be considered to exist is 11 grams of hemoglobin per deciliter of blood in pregnant women and under-5 children. However, some countries have adopted their own cutoffs. There is also the problem of establishing satisfactory cutoff points for populations living at high altitudes.

At a recent meeting held in Buenos Aires, Argentina (8), information was presented from studies conducted in eight countries of South America (Argentina, Bolivia, Brazil, Chile, Ecuador, Paraguay, Peru, and Uruguay). The prevalence of anemia ranged from 61% in a non-representative urban population sample in Misiones, Argentina, to 8% in children under 5 in Venezuela (6).

Bearing in mind the aforementioned limitations, it can be estimated that at least 30% of pregnant women and between 20% and 25% of preschool children in Latin America suffer from anemia, which in most cases is due to iron deficiency.

2.2 Iodine deficiency disorders

Iodine deficiency is due to lack of this micronutrient in food. It occurs in geographic areas in which there is a low concentration of iodine in the soil and low levels of fish and seafood consumption.

The negative effects of iodine deficiency on the health of people and on the socioeconomic development of societies have been amply documented. Goiter is the most well-known manifestation of the deficiency.

Other disorders linked to iodine deficiency include some congenital anomalies, deaf-mutism, and varying degrees of neurological defect, such as endemic cretinism. This deficiency is also associated with higher rates of perinatal and infant mortality, neonatal and infant hypothyroidism, and retardation of physical and mental development.

Endemic goiter is considered a public health problem when the prevalence exceeds 10% in a population. With regard to urinary excretion of iodine, when median levels in a community are less than 5 mcg/dl of urine, the community is considered to be at moderate to high risk of suffering iodine deficiency disorders.

In the region, recent information from some countries has been derived from national surveys. In other cases, surveys have been carried out in endemic areas. Some countries, such as Argentina, have established a specific surveillance system for this purpose.

Of 11 countries that carried out surveys at the national level or in endemic areas, 8 found goiter prevalences of between 20% and 50% in the population studied (Bolivia, Brazil, Ecuador, El Salvador, Guatemala, Nicaragua, Paraguay, and Peru).

The most effective and economical method of preventing endemic goiter is the addition of iodine to salt in a proportion generally expressed in parts of iodine per million parts of salt (ppm). A concentration of 30-100 ppm is recommended (9).

Establishing an effective salt iodization programs requires the enactment of appropriate legislation and regulations, sufficient financing, high-level political commitment, and administrative, technical, and operational support for the production, marketing, and quality control of the iodized salt, as well as education of the community in order to prevent consumption of uniodized salt (10).

2.3 Vitamin A deficiency

In addition to the well-known role that vitamin A plays in human vision, it has been demonstrat-

ed that retinol—the active form of vitamin A—is essential to immune function, reproduction, and growth and integrity of the epithelia. Epidemiological studies in recent years have shown the importance of subclinical vitamin A deficiency and its implications for child morbidity and mortality.

Vitamin A deficiency is the result of insufficient dietary intake, malabsorption, or depletion of bodily reserves due to infectious illness. Children aged 6 months to 5 years are at highest risk of suffering this deficiency, especially after weaning.

Serum retinol values of under 20 mcg/dl are classified as low, while values of under 10 mcg/dl are considered deficient. An urgent public health problem is considered to exist when 10% or more of children between 3 and 6 years of age have serum retinol levels of under 20 mcg/dl.

Studies carried out by the Institute of Nutrition of Central America and Panama (INCAP) in the 1970s found that the prevalence of vitamin A deficiency among under-5 children was between 18% and 43%. Several countries initiated programs to enrich sugar with retinol palmitate, which reduced the problem significantly. This prophylactic measure was suspended around 1980, but it has been resumed recently, and sugar enrichment is being considered by other countries.

Recent national surveys aimed at determining the prevalence of serum retinol found that 20% of children studied in El Salvador, Guatemala, and Nicaragua had levels of below 20 mcg/dl. In other studies, the prevalence of low serum retinol has been found to be 10% in some areas. It can be concluded that vitamin A deficiency constitutes a public health problem in certain geographic areas, generally rural and economically depressed regions (11, 12).

It is possible to eliminate vitamin A deficiency as a public health problem in the region by the year 2000 through the application of measures such as enrichment of certain staple foods in order to increase dietary intake of vitamin A, administration of massive doses of vitamin A to high-risk populations, production of foods rich in this vitamin, and health education for the population to encourage consumption of foods rich in iron and vitamin A, especially during weaning.

3. Nutritional status of adult women

Obesity, which begins to manifest itself during adolescence, is the most important nutritional problem among adult women in many countries of the Region. There is evidence that obesity affects all social and age groups, although its causes are different.

A recent study conducted among Chilean women found that 10% of those in the highest socioeconomic class, 22% of those in the middle class, and 40% of those in the low income strata showed excess weight-for-height.

In Barbados a rise in the prevalence of overweight and obesity was observed in both sexes, but the increase was more marked in females: 11.5% of those of school age were obese, compared to 5.3% of males. Of the women in the 35-64 age group, 55.8% were obese, compared to 25.3% of men (13, 14).

Obesity has received particular attention in the countries of the English-speaking Caribbean. If obesity is defined as a body weight of more than 120% of weight-for-height reference values (15), the rates range from 56% in Guyana to 22% in Dominica (16).

The situation is similar in Cuba, where the prevalence of obesity is 21.8% among adults 15 years of age and older, and the rates among women are double those among men (17). In the French-speaking Caribbean, 60% of women aged 45 or older have been found to be obese (18).

The problem of obesity requires special attention. It is well known that obese people not only have reduced life expectancy, but they are also at greater risk for diabetes, hypertension, heart attack, and chronic respiratory disease. Moreover, they are prone to other physical, social, and emotional disorders, many of which can be alleviated simply by reducing body fat (16).

4. Nutritional status of pregnant women

The nutritional status of a woman during pregnancy affects the development of the fetus and the nourishment of the child during the first months of life. During pregnancy, an adequately nourished woman accumulates energy in the form of body fat, which will be used for the production of milk.

In general terms, a weight gain of one kilogram a month during the second and third trimesters of pregnancy is considered the minimum acceptable amount. The increase is due to growth of the fetus and products of conception and an increase in certain body fluids and in body fat. Nutritional status and weight gain vary with height and nutritional status prior to pregnancy.

Unfortunately, many pregnant women do not receive regular prenatal care; some are seen only once during the entire duration of their pregnancy. In these circumstances, it is difficult to determine nutritional status. However, reference tables of weight-for-height by week of pregnancy have been developed, as have curves showing expected weight gain in relation to height (20, 21).

Short stature is an important factor associated with the outcome of pregnancy. It has been demonstrated that infant mortality among children born to the shortest women in the Maya population of Guatemala is double that of children born to taller women (22). Given the impact of adequate nutrition on height during growth, nutritional interventions aimed at women should not be limited to the period of pregnancy. Those carried out during childhood will unquestionably have an impact on pregnancy outcomes.

Little information exists on the nutritional status of pregnant women in the region. Using the Rosso curve (21), similar percentages have been found between overweight and low weight for height and gestational age in Chile (23) and Uruguay (24). It can be concluded from several of these studies that while obese women tend to remain obese during pregnancy, a sizable proportion of those who begin pregnancy with normal weight tend to lose weight during this period. This finding has implications for nutritional support programs aimed at pregnant women.

An effort is currently under way to identify indicators that will enable health personnel with limited training to assess nutritional status. Arm circumference seems to be the easiest-to-use alternative.

Prenatal care services, especially in rural areas, do not cover all pregnant women. Often it is those who are at highest risk who do not go to the services. It is therefore necessary for health workers at the community level to have a simple and reliable tool that will allow them to identify women at risk for malnutrition during pregnancy and ensure that they receive appropriate care (25).

II. Food and Nutrition Activities at the Local Level

1. Specific activities

In general, efforts to improve nutrition have traditionally been considered assistance or aid activities. In most Latin American countries, "nutrition" initiatives have included activities such as the following:

- Food aid to specific groups;
- Teaching of nutrition;
- Food and nutrition education/consumer guidance;
- Micronutrient enrichment of foods;
- Promotion of breastfeeding;
- Distribution of food stamps and coupons;
- Distribution of micronutrient supplements in specific cases (iron, iodine, and vitamin A).

In many cases an increase in national availability of foods has been achieved. However, this progress does not necessarily imply an improvement in the intake of food at the local or home level, due mainly to inequalities in its distribution.

The improvement of food intake is a complex problem that is not only a concern of the agricultural sector. Other sectors (the economic, trade, and labor sectors, among others) also intervene, although they have not always acknowledged their role in food and nutrition problems (26).

In most of the countries, over the last 10-15 years there has been a phenomenon of mass migration from rural areas to periurban areas surrounding large cities. In theory, this should mean greater access to basic health and sanitation services.

However, in practice, many of the inhabitants of these unplanned urban settlements (favelas, shanty towns, slums) lack access to such services. This situation is associated with the prevalence of preventable infectious processes, which reduce the bioavailability of nutrients.

2. Integrated approaches and community-based planning

For decades, governments and international agencies have been advocating an integrated approach to food and nutrition activities as part of overall development initiatives, both at the central and local levels. However, this has not always resulted in the identification and implementation of concrete activities (26).

Improvement of the nutritional status of the population at the local level requires an interdisciplinary process of local planning, with the active participation of the community—the main actor in this multisectoral process. From the perspective of the active members of a community, the process of planning, with emphasis on women and children, should include the following steps:

- 2.1 Assessment of the food and nutritional status of the community;
- 2.2 Design of a "causal model" of the nutritional situation and analysis of the determinants of nutritional status in the community;
- 2.3 Identification of the activities and interventions needed and of those who will be responsible for executing them;
- 2.4 Surveillance, monitoring of nutritional status, and reprogramming.

2.1 Assessment of food and nutritional status of the community

There are numerous works on the assessment of the nutritional status of communities. The classic study by Professor D. B. Jelliffe (27), *The Assessment of the Nutritional Status of the Community*, published in 1966, describes in meticulous detail how to carry out a nutritional survey. The *Guide to Nutritional Assessment*, produced by Beghin et al. in 1989 (28), is another classic in this genre. Yet another is *Nutrition in Preventive Medicine* (29), published in 1976, in which José María Bengoa and Roberto Rueda Williamson (in the chapter on planning and organization of a national policy on food and nutrition) describe the process at the national level, which is basically the same process that is applied today at the local level.

In the present chapter, the term "assessment" is preferred to "evaluation," which implies a detailed examination or "investigation" of the management of a program.

The aim here is to "assess," or "get a picture of" the nutritional status of the inhabitants of a community. The following key factors should be considered: (a) availability of food, (b) food intake, and (c) biological use of food.

Community involvement in the planning and execution of activities to improve nutritional status is nothing more than an extension or component of the process of community participation in general health activities. One example of such involvement is a local experience in southwestern Peru: the "weighing campaigns." In these campaigns, the community was informed (using appropriate communication messages) that on a certain date children under the age of 5 years would be weighed. All families were encouraged to participate. The campaign was publicized through local radio broadcasts and other news media, announcements over street loudspeakers, posters, and pamphlets. Notices were also placed in local government offices, churches, schools, bars, stores and other places.

Community leaders were involved in planning and publicizing the campaign. On "weighing day," health workers and community volunteers were stationed with their scales and other equipment in the appointed places. They showed parents how to weigh their children and explained the significance of body weight in terms of individual development and nutritional status, using growth charts.

A rapid general analysis of the results revealed those children who were undernourished and those whose nutritional status was normal, based on weight-for-age. The health workers discussed the implications of underweight and malnutrition with the participants. They also encouraged community members themselves to try to identify the possible causes of malnutrition and suggest what could realistically be done to overcome and prevent it.

Many other mechanisms exist for involving the community actively in the care of its own health. In all cases, the aim is for the community to establish its own diagnosis, identify the causal factors,

and determine which activities are necessary and can, in fact, be implemented, either by community members themselves or by local government officials or other entities, such as NGOs.

Food availability can be assessed through:

- Visits to markets;
- Comparisons of food prices with the minimum wage;
- Comparisons of the proportions of locally produced and imported foods;
- Information from agricultural extension agents;
- Visits to the field and information on food aid programs, including types of foods provided and coverage;
- Organization of focus groups to obtain information on knowledge, attitudes, and practices in relation to food and diet;
- Visits to homes, school lunchrooms and cafeterias, and health centers to obtain information on food intake patterns.

Information on *food intake patterns* can be obtained through visits to homes, school lunchrooms and cafeterias, and health centers.

The *biological use* of foods, a determinant of nutritional status, can be ascertained by means of well-known parameters: weight-for-age, weight-for-height, height-for-age, body mass index, and determination of biological indicators.

These parameters and indicators should be established mainly for preschool children and pregnant women—the groups most vulnerable to malnutrition—and for schoolchildren in some specific situations, such as for studies of goiter prevalence or for height surveys.

Height surveys among schoolchildren have been the subject of numerous analyses and discussions. They have been used mainly to target areas for intervention. Height-for-age deficits in primary school children are associated with the nutritional history and the socioeconomic and health situation of children.

Although they do yield some useful information, height surveys have limitations in terms of the information obtained. For example, there are differences between the number of children enrolled in school and the number present at the time the survey is conducted. Moreover, as occurs with health services, the children who are most disadvantaged often do not attend school.

As for the assessment of micronutrient deficiencies, the prevalence of iron deficiency can be determined by examining the records of pregnant women who receive prenatal care. These will reveal the prevalence of low hemoglobin among those attended at health services. If the prevalence of anemia is high ($Hb < 10\text{mg/dl}$) among these pregnant women, the existence of anemia among all pregnant women in the community, as well as among under-5 children and women of childbearing age, can be suspected.

When subclinical vitamin A deficiency is suspected in the community, determination of serum retinol in preschoolers is the best indicator to confirm or rule out the existence of the problem. However, a representative sample of children is required. Because it involves an invasive procedure, the determination of serum retinol also necessitates appropriate laboratory facilities. The alternative is to assess the intake of vitamin A and its precursors using a simplified method (31).

A rapid survey of goiter prevalence in schoolchildren can be carried out by school health services, if they exist, or by personnel from local health services trained in palpation of the thyroid gland.

2.2 Construction of the "hypothetical causal model " of the nutritional situation and analysis of the determinants of nutritional status in the community

Figure 1 shows several factors that may influence the nutritional status of small children. The causal model can serve as a guide for analysis of the causes of malnutrition, using the basic principles of epidemiology.

In the following scenario, for example, the assessment of nutritional status indicates that a high prevalence of malnutrition exists among preschool children aged 1 to 3 years in a certain geographic area ("Community X").

Community X is a periurban area but is relatively inaccessible due to poor roads. Its inhabitants are mainly migrants from rural areas. Unemployment is high, although some residents work in the informal sector (including some nursing women). Housing and sanitation are inadequate, which has led to a relatively high prevalence of respiratory and gastrointestinal illnesses.

Some families produce foods in family gardens, but most of the foods consumed are obtained at the only local store. The alternative is to travel into the city to shop at the market, which takes 12 hours or more. The population has abandoned the nutritious habits of their rural predecessors for a diet that is dependent on the foods that are available. Their energy intake is derived mainly from oils, other fats, and sugar.

This scenario is undoubtedly familiar to many health workers. The assessment of nutritional status and of the possible causal factors will probably reveal the following panorama:

- Illiteracy;
- Inadequate nursing and weaning habits;
- High cost of foods due to the inaccessibility of the community and the existence of only one store;
- Inadequate housing and sanitation;
- Unemployment and informal-sector employment (street vending).

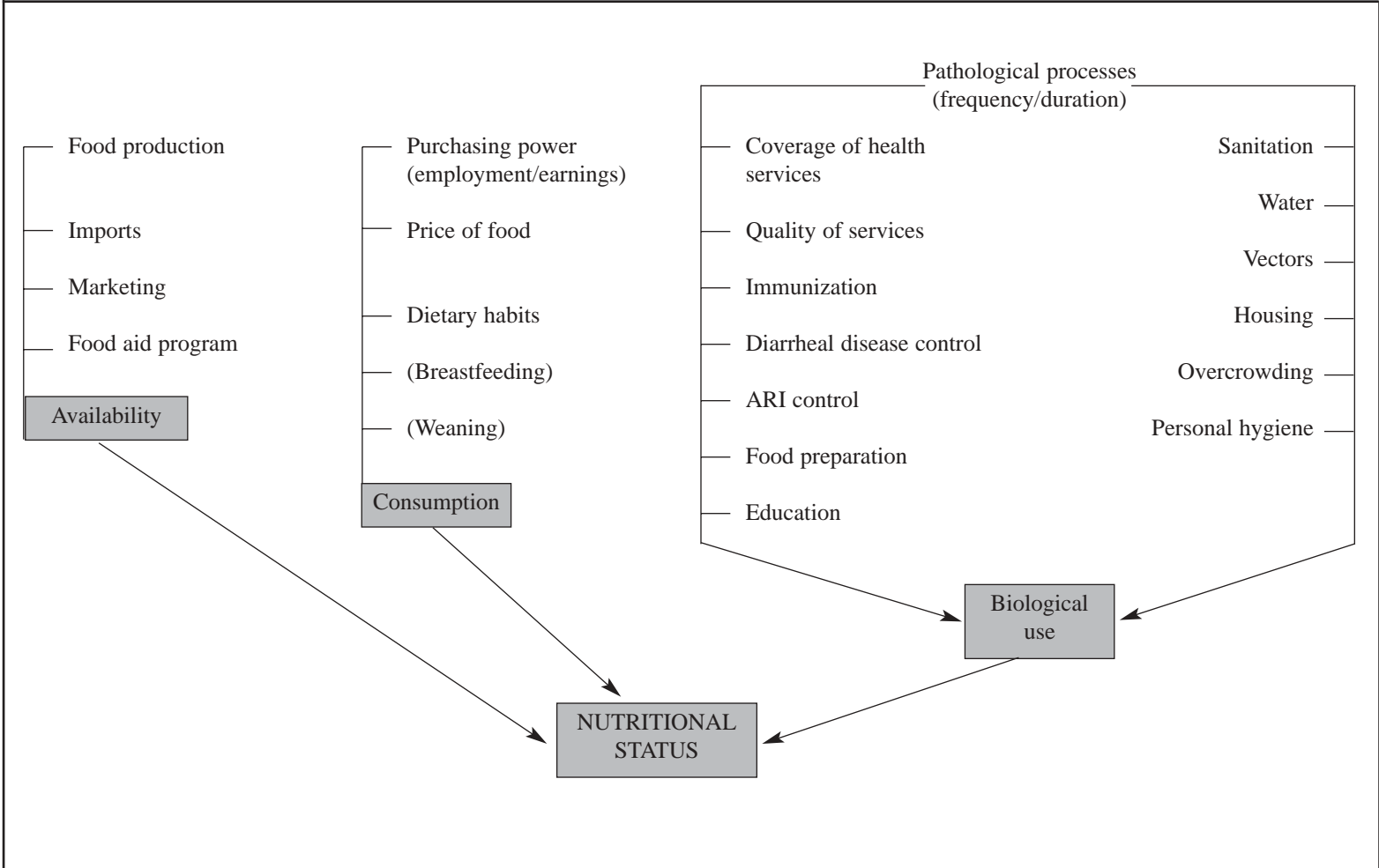
2.3 Identification of the activities and interventions needed and of those who will be responsible for executing them

The only way to overcome the situation described above is through the coparticipation of public leaders, such as the mayor and local officials responsible for health, public works, and environmental sanitation, as well leaders native to the community, including local politicians, implicitly elected spokesmen, and others.

Some of the activities that might be carried out include:

- Formation of a community health and nutrition committee;
- Ongoing campaign to promote exclusive breastfeeding;
- Improvement of weaning practices;
- Nutritional supplementation, targeting specific groups (children suffering from moderate and severe malnutrition, pregnant women);
- Health education;

Figure 1. Hypothetical causal model of nutritional status



- Iron supplementation for pregnant women, adolescents, and possibly preschool children of both sexes;
- Controls to ensure that all salt available in the local store or cooperative is iodized.

Other possible activities would have to involve sectors other than the health sector, for example:

- Community programs to repair the access road between Community X and the city, as a means of reducing the cost of transporting foods and facilitating access to the city market;
- Formation of a cooperative for the sale of foods, negotiating with the owner of the local store and incorporating it into the cooperative;
- Organization of neighborhood groups to teach literacy;
- Organization of small cottage industries, such as food canning, drying and packing fruits and vegetables, and raising rabbits, where housing conditions allow.

Such activities obviously require the support and backing of official leaders. Frequently, they also require small, low-interest loans and access to "second-level" authorities.

It is beyond the scope of this chapter to describe the entire strategy for controlling/eliminating micronutrient deficiencies (iron, iodine, and vitamin A), except as concerns iron supplementation and control of salt iodization. It is unlikely that iron and iodine deficiencies affect only Community X. Efforts to control them, therefore, will be part of a larger regional or national program, whose execution requires community participation.

The overall strategy, which includes supplementation, enrichment of foods, dietary diversification, and public information and communication, will have to be implemented and supervised from the regional or national level.

Experiences during the 1980s with the WHO/UNICEF joint program of nutritional support in southwestern Peru (30) and in Iringa, Tanzania (32), demonstrate the feasibility of community participation schemes such as the one described in the preceding paragraphs.

2.4 Surveillance, monitoring of nutritional status and reprogramming

Regular surveillance makes it possible to determine the impact of interventions or detect any deterioration in the situation.

Monitoring of the growth and development of preschoolers is the best means of monitoring nutritional status, since small children are most vulnerable to deficiencies. No complicated surveillance systems are required for this type of monitoring at the local level; indeed, the simpler the process, the more feasible it will be.

Apart from weighing campaigns, which should be repeated about every four months in order to monitor changes during that period, clinics that provide care for preschool children are the most accessible source of information.

Every time a child is seen at the clinic, in addition to the individual record in which weight-for-age is recorded on a growth curve, a "community" record similar to the individual record can be filled out. Rather than bearing the name of one child, this record will be labeled "Community X," and the weight and age of each child who visits the clinic will be recorded on the growth curve.

The WHO weight-for-age classification is used in virtually all the countries of Latin America. With a cutoff point of $\pm 2SD$, two curves appear on the growth chart. At the end of each session, there will be a record in which each point signifies the weight of a child at a given age.

Most of the points can be expected to fall into the space between the two curves; these represent children whose nutritional status is normal, based on their weight-for-age. Some points will be above the $+2SD$ curve; these children are overweight. Other points will fall below the $-2SD$ curve; these children are undernourished (see Figure 2).

A simple rule of three, which can be learned by any health promoter, community health aid, or another other health auxiliary, can be used to translate the points (number of children) to percentages. For example if 10 children are normal, 4 undernourished, and 3 overweight, the percentage of undernourished children would be 23%.

Even with the limitations of the "sample," if at the next session the percentage of undernourished children increases to 30% or 40%, this would alert the health worker to the possibility that something is happening in the community. He/she would then know that the matter should be studied further or discussed at the next meeting of the community health and nutrition committee.

When a statistically representative survey has been carried out, a comparison of the prevalence of malnutrition revealed by the survey with the data from the health services should provide a fairly accurate estimate of the proportions of children in the community who are overweight or underweight.

The principle should be: maintain the greatest possible simplicity, use the information that is regularly collected, analyze and interpret the information, and use the results of analysis and interpretation to plan interventions and introduce needed changes in programs.

III. Conclusion

Presented below are "ten commandments for good nutrition" or "ten steps for good nutrition" for use by health workers at the local level:

1. Practice exclusive breastfeeding for at least the first four months of life;
2. Do not give sweetened or unsweetened teas or other foods, such as juices, to children under 4 months of age who are being breastfed;
3. Take iron supplements (ferrous sulfate) if you are pregnant;
4. Consume only iodized salt;
5. Eat more vegetables;
6. Eat fresh fruit rather than sugar and sweets whenever possible;
7. Replace "unhealthy" fats (lard or shortening, palm oil, cottonseed oil) with "healthy" oils (sunflower, olive, corn, or sesame oil);
8. Introduce more variety into your diet by eating more traditional foods;
9. Redistribute food intake during the day; breakfast should provide at least 20% of daily energy requirements, especially for children and adolescents; and
10. Include physical exercise among your daily activities (recreational activities, walking or running, or going up and down stairs, for example).

IV. References

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Figure 2. Nutritional status of children seen at the Community X Clinic (weight-for-age)

