

PRIORITIZING OPTIONS

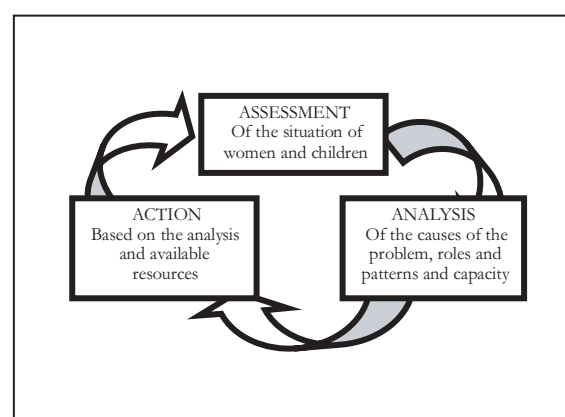
Having discussed both the efficacy and effectiveness of different interventions, we conclude by considering processes for choosing and prioritizing actions to combat undernutrition in different situations. The choice will depend on the nature and distribution of the undernutrition problem, its causes and the type of resources which are available or mobilizable. No single intervention or mix of interventions should ever be prescribed in isolation from a participatory process of problem assessment, causal and capacity analysis and programme design.

Under the ADB-UNICEF Regional Technical Assistance (RETA) Project 5671, community-based programmes in seven Asian countries in 1998 included a wide range of activities. For children, these comprised any mix of the following: growth promotion (growth monitoring, protection and promotion of breastfeeding, and the promotion of appropriate complementary feeding practices); disease management, including feeding during and after diarrhoea and oral rehydration therapy; micronutrient supplementation, including vitamin A megadoses for children from 6 months, and possibly iron supplements where anaemia is prevalent; promotion of consumption of iodised salt; deworming; and food supplementation, where relevant, feasible and cost-effective. For women, activities within antenatal and postnatal care strategies comprised: tetanus toxoid immunization; micronutrient supplementation, including iron and folic acid tablets for pregnant women and possibly post-partum vitamin A megadoses, where VAD was known to be a problem; iodised salt consumption; food supplementation during pregnancy; malaria chemoprophylaxis in endemic areas; and reproductive health education, including the need to ensure safe birth intervals.

In any one situation of significant undernutrition, there is a series of questions to be addressed when deciding on an appropriate action or mix of actions.

These questions concern the relevance of potential interventions to the problem and to the existing context, including infrastructure for implementation and other existing resources and capacity. The most efficacious approach to combat a particular problem may not be the most appropriate. Some nutrition interventions may be essential, some merely desirable. Answers are, to a large extent, situation-specific. Participatory problem-solving approaches will reveal the main causes of undernutrition and the type and amount of resources available to combat it (Figure 5). The “Triple A” process or cycle, pioneered by UNICEF is a participatory decision-making process wherein the problem of undernutrition is *assessed* (in terms of its nature, extent, distribution etc), its causes *analyzed*, along with the available resources and capacity to combat it, followed by a decision on appropriate mix of *actions*. The process is cyclical and iterative in that once the actions have been initiated, they are subsequently monitored and evaluated (*reassessment*).

FIGURE 5: The “Triple A” Process



Source: Adapted from UNICEF (1990) *Strategy for Improved Nutrition of Children and Women in Developing Countries*. New York: UNICEF.

Coverage relates to the percentage of the population at risk who are participating in the programme. Targeting concerns the degree to which this coverage is oriented towards the most needy among those who are able to respond. For example, despite evidence that undernutrition is a problem throughout the life cycle, only 6- to 24-month old children may initially be targeted, or 6- to 36-month-olds if resources permit. These are both the most responsive and the most vulnerable age-groups. Pregnant women will also usually be included, given their relative nutrition vulnerability at this time, the known links between their nutrition status and birthweight, and the fact that they may be more accessible at this time. Adolescent girls, are often at nutrition risk, but sometimes may be targeted only later in the evolution of a programme. At a higher level, targeting may be done geographically, according to poverty criteria.

Intensity concerns how much resources are used per participant: expressed either financially, as dollar per participant per year; or with regard to population and worker ratios, e.g., number of children per community-level worker or mobilizer, number of facilitators or supervisors per mobilizer. Past experience has suggested that around US\$5 to 15 per participant per year seems to be associated with effective programmes: at least those that do not include provision of additional food, which approximately doubles the cost. In many cases, well conceived programmes may be ineffective simply because their coverage is too low to have a broad impact on the problem, or because they do not reach those most in need. In other cases, the principles may be correct but the level of resources committed may be unrealistically low, so nothing much really happens. A detailed analysis of the coverage, targeting and intensity of the community-based programmes mentioned in Appendix I has been undertaken⁵.

Benefit-Cost and Cost-Effectiveness Analyses

Benefit-cost and cost-effectiveness analyses are also important, albeit not essential, for prioritizing options. Benefit-cost analysis asks whether a nutrition investment should be made in the first place or, if it exists, whether it should be expanded, contracted or terminated. A stream of benefits is calculated and discounted into a net present value. The cost stream is also calculated, discounted and summarized in a net present value. The ratio of discounted benefits to discounted costs is the benefit-cost ratio. Benefit-cost analysis is also useful for comparing interventions that have an impact on nutrition, but through very different

routes; e.g., a school-based feeding programme versus an infant growth monitoring programme. In these cases, money can often serve as a common denominator for different outcome measures; e.g., improving school attendance, increasing employment and improving child nutrition status.

Once a specific public investment in nutrition is justified, based on a sufficiently high benefit-cost ratio, cost-effectiveness analysis is used to examine project design options for delivering expected impacts at the lowest cost. A cost-effectiveness analysis can, for example, compare three different project designs and evaluate them in terms of how much they cost to increase the weight of 1,000 of the targeted preschool children by 10%.

One commonly used effectiveness measure for health interventions is the disability-adjusted life year (DALY). This combines years lost due to mortality with years lost to morbidity. Nutrition interventions (as general, preventive, public health measures) have an extensive estimated benefit in terms of reducing the burden of disease, as measured by DALYs.

Determining Unit Costs of Interventions

The calculation of benefit-cost and cost-effectiveness measures is complex. For cost-benefit analyses, it is necessary to determine what would have happened to outcome *x* in the absence of the intervention. Would the private sector or an NGO have stepped in to deliver the services instead? In other words, the gross change in outcome *x* will not be the same as the net change. It is also necessary to decide whether to assign a higher weight to an intervention that, for a given cost, delivers a change in *x* to the poor as opposed to another intervention that delivers the change in *x* to the nonpoor. Most estimates, including those here, do not address these important considerations.

The important first step in generating benefit-cost and cost-effectiveness calculations is to obtain the unit costs of different interventions. Fortification and supplementation have low unit costs: ranging from US\$0.05 per person per year for iodine fortification to US \$1.70 for iron supplementation per pregnancy⁴⁹². The unit costs of other nutrition programmes are higher. Mass-media programmes cost around US\$1 per day per person, whereas community-based programmes cost about US\$3-8 per day per person, depending on their intensity⁴⁹². Feeding programmes and food subsidies undertaken since 1980s and early 1990s, (e.g., the PDS in India) have often been untargeted or poorly targeted, and have been by far the most expensive nutrition interventions. However, comparative unit cost calculations have not been

undertaken for more recent, targeted, food-based programmes; e.g., Progresa in Mexico, and the Food For Education Programme in Bangladesh⁹.

It is, however, misleading to rank interventions solely on the basis of cost. Perhaps the more expensive programmes are better able to reach the poor, to have a larger effect on them, and to help them reduce their future need for the intervention. To assess interventions in this light, we need to look at benefit-cost and cost-effectiveness measures.

Cost-Effectiveness

The cost-effectiveness of various key nutrition interventions has been assessed⁴⁹². Costs per death averted by breastfeeding promotion and IEC (PEM) are estimated as US\$100-\$300 in the poorest countries (Bangladesh, Cambodia, India, Viet Nam) and are also in the same range in Pakistan, which has surprisingly high levels of undernutrition given its higher per capita income. Estimated costs per death averted for vitamin A megadosing are in the same range for all countries except for Sri Lanka, which has by far the lowest infant mortality rate in this group of countries (comparing across countries, costs per death averted are inversely related to levels of mortality). The estimated costs per death averted for iron supplementation are markedly higher than for other interventions, because maternal death rates are lower than infant mortality rates. Note, however, that iron supplementation also has effects on productivity.

The results again suggest that nutrition interventions in low income Asia are a high priority in terms of high benefit-cost ratios, and low costs per death averted. If programme costs are identical across

countries, then the countries where interventions are of the highest priority are those with highest current death rates and prevalences of nutrition deficiency: Bangladesh, Cambodia and Viet Nam, the poorest countries; and Pakistan, which also has surprisingly poor human resource indicators given its level of income. India is also a country of high priority, although the prevalence figures for micronutrient deficiencies appear to be underestimates. If costs of nutrition intervention are lower in countries with better primary health care systems, this would tend to improve the benefit-cost and cost-effectiveness rankings of the PRC, Sri Lanka and Viet Nam. However, good data on the variation of programme costs across countries do not exist.

Current best estimates for the cost-effectiveness of fortification programmes (Table 12) confirm previous findings⁴⁹².

Supplementation is about ten times more costly than fortification, and hence is most appropriate when the target group is less than 10% of the population; e.g., under 2-year-olds who are the target for vitamin A supplements. Supplementation is also the intervention of choice for population groups who cannot be reached by fortification.

It is important to remember that, in practice, the analysis of the cost-effectiveness of nutrition interventions is not as straightforward as is portrayed here. Context is important. The nature of the problem, the ability to target and to minimize leakage, the level of capacity to implement the intervention, and the bundling together of interventions in the field, make it very difficult to make generic statements about the cost-effectiveness of different types of intervention. All of these factors need to be taken into account more fully in the next wave of cost-effectiveness estimates.

TABLE 12: Costs and effects of micronutrient interventions

Deficiency	Cost (US\$)/beneficiary/year	Cost (US\$)/life saved
Iron deficiency		
Supplementation of pregnant women	1.70 (per pregnancy)	800
Fortification	0.09	2,000
Iodine deficiency		
Supplementation (reproductive age only)	0.50	1,250
Supplementation (all)	0.50	4,650
Fortification	0.05	1,000
Vitamin A deficiency		
Supplementation <5	0.20	325
Fortification	0.05-0.15	1,000
Nutrition education	5.00	238

Source: Institute of Medicine (1998) *Prevention of Micronutrient Deficiencies*. Washington DC: National Academy Press.

Key “Minimum Packages”

Because undernutrition is usually the result of many factors, it is not surprising that it has been attacked most effectively in situations in which several sectors and strategies have been brought to bear. Combining improved infant feeding, better household access to food, and improved and more accessible health services and sanitation, is clearly more effective in combatting undernutrition, (where food, health and care are all problems) than any of these measures taken alone. Given the well documented synergies between such actions, the combined effects are often more than additive. Actions can be initiated to impact on different levels of the problem; immediate, underlying or basic (see Figure 2).

The timing, duration, and breadth of an intervention modify its effect. Generally, the earlier and the longer an intervention, the more frequent the interpersonal contacts (i.e., more “intense”), the greater its benefits. This is true for both the initial and the later size of the effect, as well as for its duration. If timing and duration are held constant, multifocal interventions (e.g., health, nutrition, and optimal child care) will yield larger and more sustained benefits than unifocal interventions (e.g., supplementary feeding)⁴⁶⁸. Short term and unifocal interventions that begin during the later preschool period will do little to repair the damage from a history of undernutrition, poor health, and less than optimal caretaking. The merit of late interventions, even during the school years, is to prevent or remedy the adverse effects of concurrent health and nutrition problems that often interfere with learning and performance.

The Triple A process (Figure 5) will lead to an appropriate choice of actions in any situation, as reiterated throughout this review. It is possible, however to highlight the elements of “minimum packages” of key interventions of proven efficacy and effectiveness for different vulnerable groups in the life cycle, as follows.

For young children: promote exclusive breastfeeding for about six months; promote appropriate complementary feeding, starting at about six months, in addition to breastfeeding until 24 months; promote appropriate nutrition management during and after illness; foster psychosocial stimulation between caregivers and children; ensure adequate vitamin A intake; provide iron supplements where prevalence of deficiency is high; and promote regular use of iodized salt by all families.

For adolescent girls: improve access to family planning and to reproductive health services, aimed at delaying first pregnancy and improving knowledge and practices related to reproductive health and

nutrition; provide nutrition education through schools, religious organizations, marketplaces or workplaces, and health promotion, based on research that has identified cultural and institutional constraints and detrimental attitudes and practices; prevent and treat sexually transmitted diseases, parasites, and micronutrient deficiencies; and provide supplementary food through school meals, in order to increase school attendance, and to serve as an opportunity for health and nutrition education.

For pregnant and post-partum women, provide the following through service delivery: iron and folate supplements, during pregnancy; monitoring pregnancy weight gain; antimalarials, antihelminths, and other micronutrient supplements, as appropriate, including post-partum vitamin A in VAD areas; prompt diagnosis and treatment of illness; and supplementary food, targeted to at-risk and undernourished women, using appropriate indicators for screening, and beginning as early as possible during pregnancy. The following should also be promoted: provision of counselling and education on nutrition, breastfeeding, family planning, HIV, and disease prevention education; and involvement of men and other family members in behaviour modification activities, so that they increase the demand for health services for girls and women.

Such minimum packages of interventions should be integrated into all primary health care projects, with community-based workers playing an important supportive role in catalysing improvements in home-based caring practices.

Programme Management Principles

The main elements of successful community-based nutrition programme management practices (dealt with in greater detail in related papers⁶⁷) are briefly highlighted here.

Good management is critical for sustained success in nutrition programming⁴⁵⁵. Progress in nutrition programming has been made where community-based programmes are linked operationally to service delivery structures, which are often village-based, primary health care outlets. Government employees at such levels may be oriented to act as *facilitators* of nutrition-relevant actions, which are coordinated and managed by community-based *mobilizers*, who are often volunteers selected by local communities. The mobilizer-facilitator nexus should be supported and managed by a series of organizational structures, from the grassroots to national level, and underpinned by broad-based social mobilization and communication strategies. Thailand has led the way in Asia with regard to such community-government partnerships.

The type and scope of relevant actions, around which community-based programmes are developed have been described above. The choice of the appropriate mix of actions and how they are to be implemented and phased over time will depend on the nature of the problems, their causes and the feasibility and cost-effectiveness of different strategies. Locally selected indicators may be used by mobilizers and facilitators, for both planning and monitoring.

At national or state levels, enabling policies and programmes are needed which explicitly consider the nature and causes of the undernutrition problem and thus the type of sectoral fine tuning that may result in improved outcomes (or at the very least will not exacerbate the problem). Policy-making should be more bottom-up than in the past, with a greater emphasis on what can be learned from community-based success and how best to enable and to accelerate it. This does not imply the exclusion of top-down, centrally derived solutions which may have a role in certain situations⁷.

Contextual and programme-specific success factors have been summarized as follows⁴⁹³.

Contextual Success Factors

- Political commitment at all levels of society was considered essential for social mobilization at the start of the programme or project and for future sustainability. The integration of nutritional goals in development programmes in general is a clear manifestation of genuine awareness and political commitment.
- A culture where people, particularly women, are involved in decision making was a prerequisite for people's participation and the creation of articulate bottom-up demands. A high level of literacy, especially among women, also associated strongly with participation and organisational capabilities.
- Community organisations e.g. womens groups, people's NGOs, credit associations, youth clubs or peasant associations, along with good infrastructure for the delivery of basic services, including committed and capable staff.
- Charismatic community leaders, who can mobilise and motivate people to do more for themselves in a genuine self-reliant way.

- The parallel implementation of poverty-reducing programmes, particularly those integrated with nutrition-oriented programme/project.

Programme Success Factors

- The creation of awareness of the high prevalence, serious consequences and causes of malnutrition, including the hierarchy of immediate, underlying and basic causes, and the need to address causes at all three levels.
- The initiation, promotion and support of a process whereby individuals and communities participate in assessing the nutrition problem and decide on how to use their own and additional outside resources for actions.
- Clear identification and definition of time-bound goals (targets) at all levels of the programme/project. Young children from birth up to two to three years of age, pregnant and lactating women, and adolescent girls were normally the focus.
- The identification and support of facilitators and community mobilisers, providing a sense of joint ownership of the programme/project by the community and the Government.
- Good management of the programme/project, including effective leadership, training and supervision of facilitators and mobilizers, an appropriate balance between top-down and bottom-up actions and effective community-based monitoring.
- The involvement of local NGOs, who often provided excellent facilitators as well as culture-relevant training. They were usually accountable to the community, which facilitated sustainability.

Overall, the generic lessons to be learned from past experience with community-based nutrition programming (see bullets above) relate more to the approaches adopted than to what was actually done: more of "how" than of "what". For maximal long term sustainable impact, both process and outcome orientations need to be integrated. Ownership is fundamental to success, with respect to means and to ends. Tools such as the Triple A cycle (Figure 5) and the conceptual framework (Figure 2) are extremely useful in making the process and outcomes explicit to all stakeholders, thus improving communication and fostering ownership.

Role of Programmes in National Nutrition Improvement

One important question concerns where, in the historical process of economic development, do nutrition programmes have their most important role? This depends to a considerable degree on the extent of administrative and physical infrastructure, its outreach, and the extent of local organizational capacity. These can then allow flows of resources to help to support nutrition activities at the local level. The following is an attempt at proposing priorities, with respect to levels to development.

For very poor regions within countries with extremely limited human, economic and organizational infrastructure, the very first priority is likely to be to establish accessible and relevant preventive and curative health care, and to ensure access to adequate food. Cost-effectiveness data suggest that many primary health interventions (e.g., immunization against diphtheria, polio and tetanus (DPT), measles, TB, rotavirus and hepatitis B) should all precede programmes aimed at protein-energy undernutrition, as should other primary health care such as the treatment of measles with vitamin A, and use of antibiotics for ARI⁴⁹². Micronutrient interventions have similar high levels of cost-effectiveness.

Once these programmes have been implemented, then it is feasible to consider extending the system and intensifying nutrition activities. This could be achieved by training existing health workers, and recruiting nutrition workers and nutrition volunteers as, for example, in Thailand⁶. The advantage is that existing health workers can provide support and supervision. This in turn requires investments in training, training materials, initial equipment (e.g., scales) as well as recurrent expenditures (micronutrient supplements, deworming tablets in endemic areas, growth charts). Although the supplies are of very modest cost per child, nonetheless these amounts become very substantial at anything approaching national scale. Countries may wish to follow the approach adopted by Thailand and the Philippines in the targeted Early Childhood Development programme (and also the PRC in the 100 counties model (see Appendix I), and begin with the highest priority areas.

Programmes also necessarily differ between urban and rural areas: in urban areas, slums are a high

priority, but it may be very hard to use volunteers in such areas. By definition, high priority rural areas are most likely to be remote or difficult to access, to have dispersed populations, and to lack basic facilities, such as a local doctor, clinic, or school.

Nutrition programmes have a role whether or not the underlying trend is one of nutrition improvement. Underlying trends are too slow to combat undernutrition in Asia within an acceptable time¹¹. An analogy can be drawn with public health measures, which are essential even when health conditions are tending to improve.

In upper low income countries (i.e., those with per caput GNP of about US \$760-3000), programmes are more feasible, but are not so widely needed as the problem is usually less prevalent. The social and regional targeting of well organized, efficient, programmes becomes increasingly important; e.g., in the Philippines and Thailand. Nutrition programmes in this group may also have important beneficial interactions (through human capital formation) with growth. In some cases (e.g., small island developing States, such as the Republic of Fiji Islands, and Tonga) child undernutrition is not a public health problem although child obesity may be¹.

In middle income countries, such as Malaysia, nutrition programmes eventually merge with social welfare and health services. They may not be such a priority for the whole country, but need to be targeted to reduce disparity, where it exists, and to buffer any social groups that are marginalized during the growth process. As countries industrialize, food becomes more accessible and health care more extensive and better. Social welfare and services and legislation become relatively more important, and may buffer the nutrition needs of vulnerable groups during economic shocks. In such countries, where there is the economic potential to do something about undernutrition, an overriding concern is often equity, both regional and social.

The value and success of direct nutrition interventions will thus depend on factors such as their historical timing, their relevance to the extent, type and causes of undernutrition, the degree of community ownership of the programme, the infrastructure and management capacity for implementation⁷ and the political will and resources to ensure sustainability.