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on

LITERATURE REVIEW AND TARGETING FRAMEWORK

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Targeting Guidance Project No. 938-0800 and No. 938-0700

by

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The following preliminary report consists of two parts: a) a review of existing literature on targeting, particularly the literature concerning delivery of health services and food resources; and b) the initial development of a framework for comparing feasibility, appropriateness, costs, and effects of various targeting strategies.

Since the comparative framework builds upon the existing literature both tasks are treated together. The annotated bibliography is shown as the Appendix. While the citations are fairly complete, additional annotations will be provided in the final report.

FRAMEWORK

A common argument advanced by advocates of supplementary feeding programs is that these programs will remain a viable and necessary option to reduce the incidence of malnutrition and/or rehabilitate the severely malnourished until such time as trends in food prices and income distribution are sharply altered.' Given the current prognosis for general development in the present world economy, the anticipated time period for such alteration is measured in decades rather than years. Opponents of supplementary feeding programs quickly point out that benefit/cost analyses of feeding programs often fail to reveal "justifiable" benefits for the costs incurred. In our view, this failure may be attributable to two causes: a) the programs really do fail, either in design or, more often, in execution; and b) the methodology for measuring costs and benefits is imperfect.²

²A supporting argument is offered in Shlomo Reutlinger and Marcelo Selowsky, Malnutrition and Poverty: Magnitude and Policy Options, World Bank Staff Occasional Paper, No. 23 (Baltimore, Md.: Johns Hopkins University Press, 1976), p. 7.

²A note of caution is offered to the interested reader. Every benefit/cost or cost/effectiveness study is

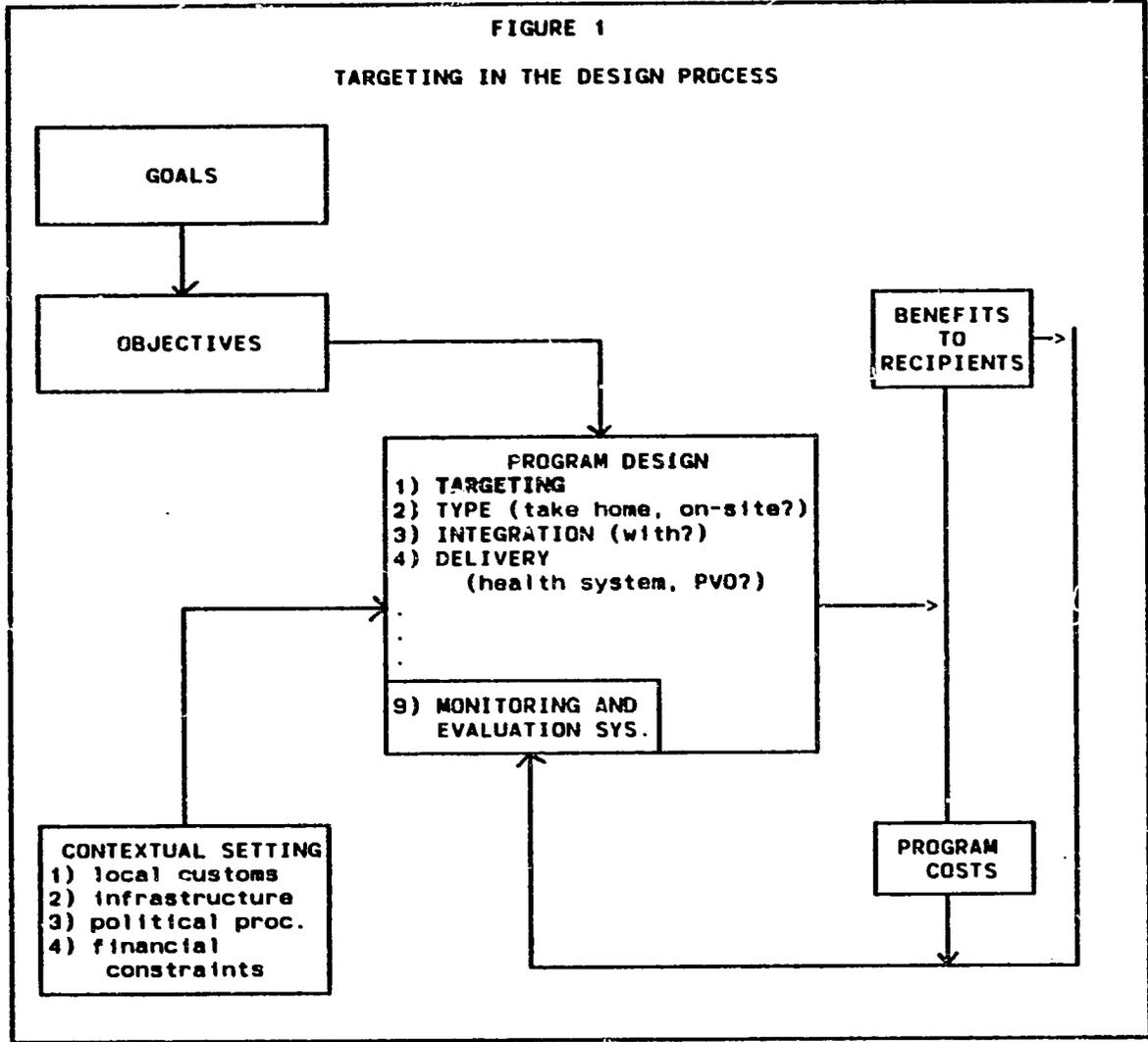
One design element thought to enhance benefits relative to costs is increased targeting. Targeting is the procedure by which a select population, optimally suited to receive an intervention, is established. The rationale for targeting is straightforward--by channeling resources to those most in need, the benefits derived from those resources should increase. The purpose of this study is the exploration of the costs and benefits of various targeting strategies. As we shall see, targeting is one of a series of critical design elements in any intervention and therefore, as difficult to assess in terms of its costs and benefits as the interventions themselves.

We begin with a pictorial representation of the intervention design process. Figure 1 is one such representation. The targeting strategy is one of a series of design elements which must be decided upon simultaneously prior to implementation of an intervention.

The process is "driven" by the broad goals and more specific objectives of the intervention. Of particular relevance in the selection of a targeting strategy are the objectives relative to cure and prevention of malnutrition. Beaton and Ghassemi, in their review of supplementary feeding programs, have recommended that targeted populations reflect the true objective(s) of the program.³ For example, the goals of rehabilitating severely malnourished children in a community and lowering the incidence of malnutrition of children in the same community should lead

marked by a set of simplifying assumptions. The results of such studies must be assessed in light of those assumptions. Policy makers who cite the conclusions of such studies without acknowledging the underlying assumptions are in grave danger of supporting policy on the basis of incomplete information.

³George Beaton and Hossein Ghassemi, "Supplementary Feeding Programs for Young Children in Developing Countries," American Journal of Clinical Nutrition, Vol. 35, No. 4 (April, 1982), Supplement, p. 911.



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to programs with decidedly different target populations; participants in the former would be limited to malnourished children, whereas in the latter, a broader definition of "at-risk" would lead to the inclusion of a much larger group. Howard Barnum et al. point out that unless the program is strictly curative in nature, the appropriate target population is not obvious.⁴ By introducing a program objective which lays claim to prevention or by introducing multiple program objectives, the target population is expanded to reflect the complexities of cause/effect formulation.

In addition to goals and objectives, program design, and especially, targeting strategies, should reflect a broad range of additional contextual factors. These include, first and foremost, local customs. Such cultural traits as propensity to share or sequence of intra-family feeding should influence the selection of a targeting strategy. Similarly, the targeting scheme must be consistent with the level of infrastructure in an area. Schemes requiring frequent visits from health system personnel in areas with few roads, fewer vehicles and an inability to garner the resources to alleviate those shortages should be rejected. Also, the targeting strategy must be conceived within the political context--local and national--and within the financial constraints of most intervention work. If the local political organization is opposed to directing resources to only a subset of its constituency, targeting to individuals and/or families may be infeasible.

Figure 1 emphasizes that targeting is only one of many design elements which reflect goals, objectives and the contextual setting. These elements are interrelated and should be defined jointly. For example, the targeting

⁴Howard Barnum et al., A Resource Allocation Model for Child Survival (Cambridge, Mass.: Oelgeschlager, Gunn and Hain, 1980).

strategy is intricately related to the type of program. A program calling for on-site feeding could take advantage of the gathering of the beneficiaries to mount a continuous screening program, for example, anthropometric screening calling for monthly weighings. By contrast, a take-home feeding program which requires a special effort to bring a scale to each participant should probably rely on a less frequent weighing scheme or, perhaps, dispense with anthropometry altogether. Similar arguments could be presented which relate the targeting strategy to other design elements. For example, if the health system is involved, health status could be used as a criterion for participation; otherwise, such a criterion might be infeasible. These interrelationships should become manifest throughout this paper but, first, we need to discuss the characteristics of the most often used targeting strategies and develop an initial framework for assessing their costs and benefits.

TARGETING STRATEGIES

Three fundamental targeting strategies can be identified, namely geographic targeting, targeting to families, and targeting the individual in the community. The strategies need not be mutually exclusive: either targeting to community members at risk or to individuals in the community may be preceded by geographic targeting. Should health services for the community or nutrition education for mothers accompany a feeding program, targeting to at-risk members, a preventive measure, and screening to feed only the malnourished, a curative measure, may co-exist. Table 1 presents a list of indicators for each targeting strategy. A census, other historical survey, or a special baseline survey can be used to assess socioeconomic and demographic data, thereby isolating regions, areas, and communities with low average income, high unemployment, unstable food production, and/or high mortality rates, poor

Table 1
THE INDICATORS OF TARGETING STRATEGIES

TARGETING STRATEGY CATEGORY	TARGETING STRATEGY CRITERIA	RELATIVE COST H=high M=medium L=low	PREVENTIVE VS CURATIVE P=preventive PC=mixture C=curative
Geographical	<ol style="list-style-type: none"> 1. Regional nutritional status 2. Regional Demographic Indicators: mortality or morbidity population density education level sanitary or water potability 3. Regional Socioeconomic Indicators: family income unemployment rate food production 4. Political Considerations response to stated felt need response to temporary constraint 5. Physical Proximity to support services i.e., roads, rail, existing programs 	<p style="text-align: center;">M</p> <p style="text-align: center;">L L L L</p> <p style="text-align: center;">L L L</p> <p style="text-align: center;">N/A N/A</p> <p style="text-align: center;">N/A</p>	<p style="text-align: center;">PC</p> <p style="text-align: center;">C P PC PC</p> <p style="text-align: center;">PC PC PC</p> <p style="text-align: center;">N/A N/A</p> <p style="text-align: center;">N/A</p>
Family (no anthropometrics required)	<ol style="list-style-type: none"> 1. Children's age 2. Number of Siblings 3. Family Income/Occupation 4. Family Wealth/ Housing Type, Caste, etc. 5. Mother's Status--health condition, pregnancy, lactation 6. Mother's Education 7. Child Spacing 8. Age of Parent, <18 or >40 9. Family Mortality Level 10. Number of Parents (1 or 2) 	<p style="text-align: center;">M M M M M M M M H L</p>	<p style="text-align: center;">P PC PC PC PC P P P P P</p>
Individual Child (anthropometric or other child specific assessment required)	<ol style="list-style-type: none"> 1. Nutritional Status <ol style="list-style-type: none"> a) weight-for-age b) weight-for-height c) height-for-age d) arm circumference e) quac stick 2. Disease Status 3. Immunization History 4. Medical Criteria or Judgement 	<p style="text-align: center;">H H H M M M M M H</p>	<p style="text-align: center;">C C C PC PC PC PC PC PC</p>

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housing and sanitation, etc.

Studies have found that identification of at-risk individuals with appropriate indicators is useful in preventing severe malnourishment, lowering mortality rates, and curbing infectious disease, such as diarrhea. Some of the at-risk factors used to select program participants are culturally, if not regionally bound, but others, such as children's age, family income, and whether women are pregnant and lactating, have been universally applied with success. The posture here, as in targeting geographically, is to reduce the incidence of malnutrition among children. Targeting to only malnourished children, on the other hand, reduces the target population but is not directed at reducing the incidence rate of malnutrition or of certain infectious diseases. Presumably, if more healthy children are also targeted for supplemental feeding, reducing the likelihood of certain infectious diseases (e.g., measles), the likelihood of exposure to those diseases for the severely malnourished child is thereby reduced. Immunization serves the same purpose of reducing exposure to serious disease in the undernourished.

Feeding program duration and targeting by seasons of high risk (seasons of low food production and high incidence of disease) present a temporal dimension to targeting schemes. Kennedy and Knudsen suggest in their review that take-home and on-site feeding programs require at least one to two years to produce normal weight-for-age that is sustained.⁵ The agricultural cycle and seasons of high incidence of disease could direct that program operation be limited to certain seasons or that its level of service intensity be adjusted appropriately.

⁵Eileen Kennedy and Odin Knudsen, "A Review of Supplementary Feeding Programs and Recommendations on Their Design," Revision of April 1982 Draft (By the author, 1982), p. 14.

BENEFITS AND COSTS

Recently, targeting schemes that employ both preventive and curative concepts by targeting to community members at risk and to malnourished children have been proposed as the most cost effective.⁶ Selowsky has compared the cost effectiveness of subsidized feeding programs, on-site feeding, and food stamps with an income transfer and found that a very narrow definition of children targeted makes all programs more cost effective than an income transfer (when programs are providing in excess of initial consumption and no resale of food or stamps is assumed), except low priced food stamps. (Administrative costs were also assumed equal).⁷ As one would expect, when resale is possible, only the on-site "full-feeding" program is more cost effective than an income transfer. Although the income-mediating effects of food supplements are beyond the scope of this project as currently defined, they are central to the issue of targeting strategies. Questions of the type and extent of substitution for all foods or commodities are presently unanswered. It is reasonable to conjecture that this substitution will vary with factors such as family income and size of supplement, but empirical evidence in support of these hypotheses is lacking.

In addition to substitution for other commodities is the issue of intrafamilial sharing. It is clear that in most take-home programs and even in some on-site feeding programs there is substantial sharing. Sharing reduces the curative effects of a highly targeted project and the consequent indicator but may have a significant preventive effect upon other family members. Since this preventive effect is not usually measured, typical cost benefit studies

⁶ Kennedy and Knudsen, pp. 34-35.

⁷Marcelo Selowsky, "Target Group-Oriented Food Programs: Cost Effectiveness Comparisons," American Journal of Agricultural Economics, Vol. 61, No. 5 (December, 1979).

that focus upon a single at-risk family member may drastically undervalue the overall benefits of the program. There is one data set, with which CSF has considerable experience, that contains information on this question, namely the CARE Phase III data. Analysis of these data, which is far beyond the scope of a typical program evaluation, remains to be done.

Table 2 is a list of benefit and cost categories culled from the literature and CSF experience. It is important to note here that under certain methods of analysis there is a bias in favor of curative or rehabilitative programs. For such programs, it is easier both to identify and moderate severe malnourishment and to demonstrate positive response to intervention in a relatively short period of time. However, in the long run, where effects are more difficult to measure, such rehabilitative programs may not show sustained improvement among the beneficiaries. (Relapses are quite probable.)

Anthropometric measurements of children are most commonly used as a measure of benefit. Participation rates are a function of the size of the food supplement, the value to the family demonstrated by their willingness to bring the child for the feeding (or take the feeding home), and the effectiveness of the program in reaching the target population.' High mortality rates of children and the synergistic relationship infectious diseases have with malnutrition make mortality and morbidity rates valuable indicators.' An increase in birth weights has been suggested in a number of studies as primary in reducing infant mortality among babies whose mothers received a

'Odin K. Knudsen, "Evaluating the Benefits and Costs of Supplemental Feeding of Children and Pregnant and Lactating Women" (By the author, May, 1982), Draft, p. 6.

'Barnum et al.

TABLE 2

BENEFIT & COST CATEGORIES FOR SUPPLEMENTAL FEEDING PROGRAMS

Benefits of Cost Indicator	Difficulty in Quantification E=easy A=Average D=Difficult	Difficulty in Gathering Data	
		Entire New Program	Added to Existing Program
Benefits			
1. Improvement in Nut. Stat. of children measured by	-	-	-
a) weight/age	A	D	E
b) weight/height	D	D	A
c) height/age	D	D	A
d) arm circumference	A	D	A
e) quac stick	A	D	A
2. Participation in MCH program or schooling	-	-	-
a) participation as % of target population	A	D	D
b) participation frequency or attendance rate	A	D	E
3. Mortality reduction	D	D	A
4. Morbidity reduction	D	D	E
5. Birth weight improvement	A	D	A
6. Anemia in mother	A	D	E
7. Stimulation of local food production	D	D	D
8. Worker productivity	D	D	D
9. Earnings enhancement	D	D	D
10. Macro economic effects	-	-	-
a) aggregate economic development	D	D	D
b) balance of payments enhancement	D	D	D
Costs			
1. Commodity costs, incl. transport to country	E	A	A
2. Indigenous raw materials	E	A	A
3. Vitamin and mineral additions	E	E	E
4. Transportation to storage facility	A	D	E
5. Additional packaging-materials, labor, etc.	A	A	A
6. Storage costs	A	A	E
7. In-country transportation costs	A	A	A
8. Non-person administrative costs of food handling	A	A	A
9. Equipment costs	A	A	A
10. Personnel costs	-	-	-
a) distribution to site, labor costs	A	D	A
b) on-site distribution and recording costs	A	D	A
c) VOLAG administrative costs	A	D	A
d) training costs	D	D	A
e) baseline survey costs	A	D	A
11. Survey utilizing existing data-census, etc.	A	A	A
12. Direct program opportunity costs	-	-	-
a) stock out rate	D	D	A
b) spoilage rate	D	D	A
c) leakage to non-target population	A	D	D
d) record keeping deflecting health personnel	D	D	D
13. Indirect opportunity costs	-	-	-
a) local foodstuffs disincentives if applicable	D	D	D
b) alternative programs	D	D	D

caloric supplement during pregnancy.'⁰ (The last trimester is often cited as the most important time for the mother to receive the supplement.)

Economists have sought to quantify the relationship between nutrition and a country's economic development. In so doing, indirect benefits in production and earnings from feeding programs have been identified. Such analyses have also linked cognitive development and efficiency and effectiveness of schooling to production and ultimately to nutrition levels during childhood.'¹

Cost effectiveness analyses have relied principally on the costs of the provision of food. Obviously, the ration size, the number of participants, and whether the cost of food is calculated per participant or per "participant response" enter into an evaluation of costs. Leakage-- the food escaping out of the targeted population--is a phenomenon that warrants more study, since it presently appears in analyses only as a cost to the program.'² Leakage usually takes the form of family members distributing the targeted child's supplement within the family. Beaton and Ghassemi concluded in their review that leakage was "not clearly related to apparent need of others in the family." However, the analyst needs to evaluate leakage in light of the program's objectives, be they preventive or curative in nature, and as a benefit in part, since the added food to the family may translate into increased work production.

⁰Jean-Pierre Habicht et al., "Relationships of Birthweight, Maternal Nutrition and Infant Mortality," Nutrition Reports International, Vol. 7, No. 5 (1973).

¹Alan Berg, The Nutrition Factor: Its Role in National Development (Washington, D.C.: The Brookings Institute, 1973), p. 23; and Knudsen, pp. 17-18.

²See for example, Kennedy and Knudsen, Selowsky and Reutlinger and Selowsky.

A FRAMEWORK FOR ANALYSIS

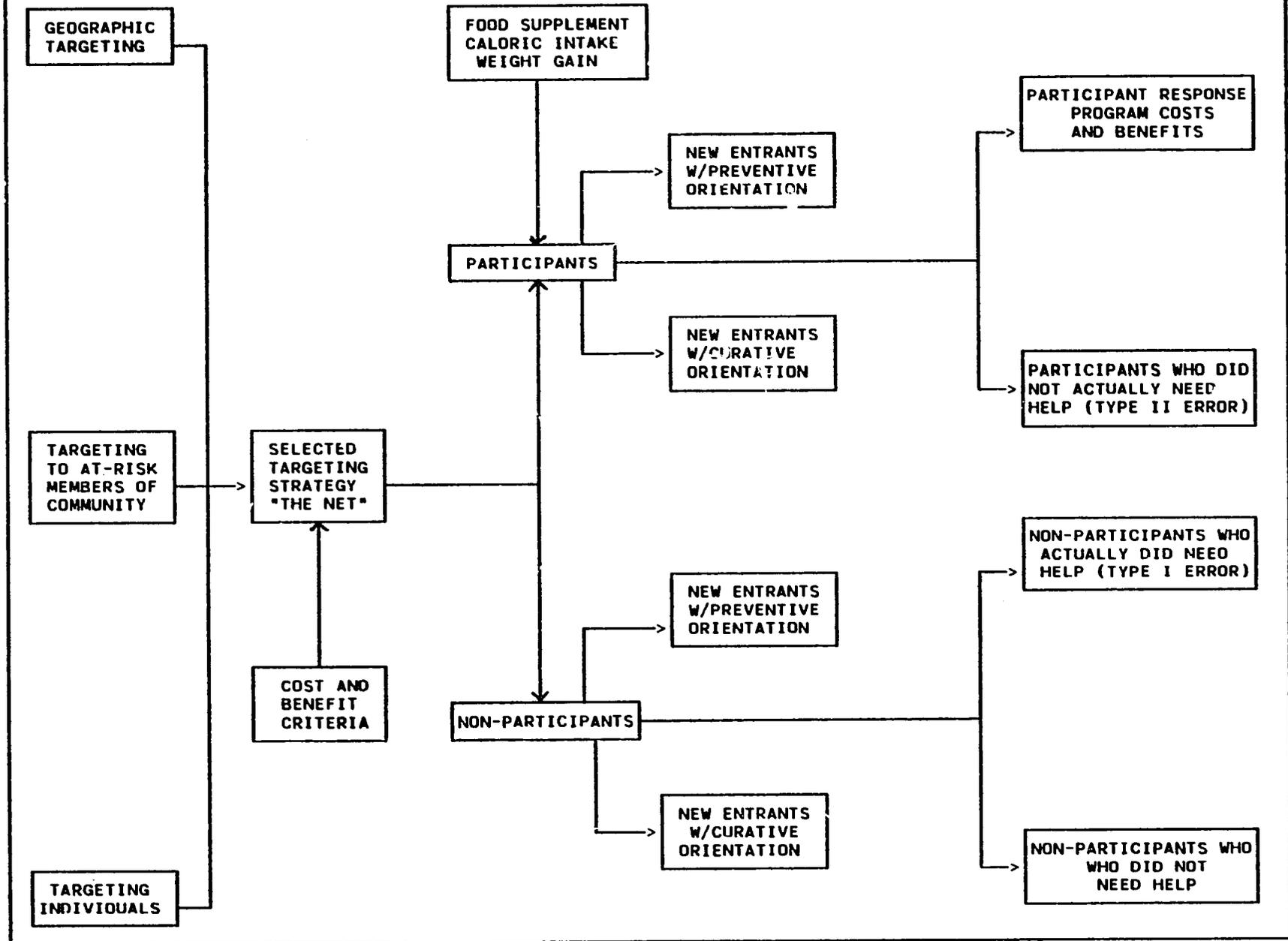
Figure 2 diagrams the general framework for comparing characteristics of various targeting strategies by simulation. The framework allows for selection of one or more of the fundamental targeting strategies to be interpreted by a set of factors likely to generate a participant response. Cost and benefit parameters, where they exist, would be adjusted appropriately for examination of each strategy. Furthermore, for each simulation model, the food supplement would be manipulated (based on an assumption that a certain amount of caloric intake produces a specific weight gain) to compare the responses in weight gain for each intervention design. Austin and Zeitlin have recommended that "the ration size should be larger than the average deficit to compensate for leakages or diversion of the supplement through intrafamilial distribution and substitution of the ration for the normal diet."¹ They conclude that about one-half of the supplement is consumed by family members other than the targeted child when the distribution is take-home. For on-site programs they predict a one-third to one-half substitution rate.

From each simulation we would know immediately the participant population size, the average nutritional status of its members, and socioeconomic characteristics of the group. These results alone are of considerable value. The availability of longitudinal anthropometric data, however, enables us to follow the change in nutritional status of the participants and "non-participants" through time. Actually the non-participants have received treatment during the life of the program as well. However, there exist subpopulations of children in the data sets whose intensity of

¹James E. Austin and Marion F. Zeitlin, eds. Nutrition Intervention in Developing Countries: An Overview (Cambridge, Mass.: Oelgeschlager, Gunn and Hain, 1981), p. 32.

FIGURE 2

FRAMEWORK FOR COMPARING TARGETING STRATEGIES



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participation or duration of participation were markedly brief. Thus, by indexing duration of participation, we can partition the non-participation group and estimate the misclassification error.

Furthermore, we may be able partition both participant and non-participant groups as to their orientation (preventive or curative) at time of entry into the program. In-migration, new births, and program expansion will provide for a set of children of diverse ages suffering from varying degrees of malnutrition.

APPENDIX

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