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9. ABSTRACT

When the process of economic growth bypasses the lowest income groups, particularly in rural areas, it is not surprising that little improvement in health and nutrition occurs. The Pan American Health Organization found that in Argentina, Bolivia and El Salvador death rates of children under five years of age in rural areas were nearly twice those of metropolitan areas. Moreover, they note that the rural areas studied are close to medical centers and thus mortality in the remote rural populations is probably even higher. Yet in these same countries -- indeed in almost all low income countries -- one finds a highly skewed distribution of health services, with doctors, nurses, hospitals, etc. concentrated in urban areas.

This paper attempts to evaluate the redistributational impact of nutrition and health programs in low-income countries. Unfortunately there is a glaring lack of data upon which to base conclusions. This lack of empiricism of effectiveness, costs and coverage has made it difficult to consider health and nutrition within the broader context of economic growth. Yet such information is essential if efficient allocation of resources is to occur, and if the growth-promoting and redistributational effects of health and nutrition programs are to be recognized and utilized.

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**HEALTH, NUTRITION AND INCOME DISTRIBUTION**

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**Paper prepared for the Princeton/Brookings Income Distribution Project**

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"When the whole property of this universe has been inherited by all creatures, how can then there be any justification for the system in which someone gets a flow of huge excess, while others die for a handful of grains?"

- P. R. Sarkar<sup>1</sup>

"Unfortunately, the tragedy of the poor may be used to justify programs which at best provide them small palliatives and at worst allocate their benefits to the more well-to-do persons who control the economic and political system."

- John Mellor<sup>2</sup>

## I. INTRODUCTION

Among the strong arguments for income redistribution is the prevalence of malnutrition and ill health among the poor in low-income countries. Without question, much of the burden and suffering imposed by disease, hunger and malnutrition in these countries could be reduced through the more equitable distribution of resources and services coupled with a reasonable rate of economic growth. Although the dramatic demonstrations of this proposition have occurred in socialist countries, most notably Cuba and China, there is no indication that it is inherently limited to these countries. The significant decline in infant mortality in New York City in the first three decades of this century has been attributed to socio-economic improvement of the poor and developments in the field of public health, rather than to advances in medical science.<sup>3</sup>

When the process of economic growth bypasses the lowest income groups particularly in rural areas, it is not surprising that little improvement in health and nutrition occurs. The Pan American Health Organization found that in Argentina, Bolivia and El Salvador death rates of children under five years of age in rural areas were nearly twice those of metropolitan areas.<sup>4</sup> Moreover, they note that the rural areas studied are close to medical centers and thus mortality in the remote rural populations is probably even higher.<sup>5</sup> Yet in these same countries -- indeed in almost all low income countries -- one finds a highly skewed distribution of health services, with doctors, nurses, hospitals, etc. concentrated in urban areas.

This paper attempts to evaluate the redistributive impact of nutrition and health programs in low-income countries. Unfortunately there is a glaring lack of data upon which to base conclusions. This lack of empiricism on effectiveness, costs and coverage has made it difficult to consider health and

nutrition within the broader context of economic growth. Yet such information is essential if efficient allocation of resources is to occur, and if the growth-promoting and redistributive effects of health and nutrition programs are to be recognized and utilized.

### The Attraction of Nutrition and Health Policies

In an effort to improve income distributions at least in the sense of increasing the income and welfare of the lowest income groups health and nutrition programs are conceptually attractive. Certainly the poor would benefit from more food -- especially nutritious food --, from improved medical care, and from public health measures. Given estimates that a majority of the rural populace in some areas receive a diet inadequate in calories,<sup>6</sup> that nearly half of unmet needs for physician services are due to inaccessibility of treatment place or lack of adequate finances,<sup>7</sup> and that malnutrition and diarrheal disease -- interacting manifestations of poverty -- are the major underlying causes of death in children under five,<sup>8</sup> this redistribution argument takes on particular importance.

To the extent that nutritional supplementation and medical care represent goods and services that otherwise would have to be purchased, they constitute increments in real income. An argument is frequently made that providing food, rather than income, to the poor insures that this increment is appropriately utilized, the assumption being that food is a more important addition to welfare than say, a shirt. The fact that the lowest income groups spend 60-80 percent of their incomes on food, and that the first income increments usually result in a still higher percentage spent on food<sup>9</sup> suggests this precaution to be unnecessary. With regard to the poor, income redistribution and nutrition objectives are probably parallel.

From another point of view, health and nutrition policies may be more attractive than other policy instruments given their humanitarian appeal. Opposition from upper income and politically powerful groups may be less vigorous than in the case of welfare assistance or a negative income tax. In addition, where the benefits of health and nutrition programs are readily apparent to the recipients, they may be important means of obtaining political support, be it in a democratic country such as India, which has proposed an unprecedented eight-fold increase in its nutrition budget in the 1974-1975 Five Year Plan, or in a socialist country such as China whose rural health system is probably more extensive and more effective than that of any other low income country.<sup>10</sup>

Conceptually health and nutrition emerge as useful instruments of redistributive policies. If anything, they seem inherently biased toward the poor whose needs are greater and who will benefit more from a given nutrition or health increment than those economically better off. Health and nutrition programs would seem to represent a means of redistributing real income in favor of the poor without depending on the redistribution of money income. While conceptually attractive, it is unclear that this is in fact happening given the nature, location and magnitude of existing programs in most countries.

#### Income Redistribution and the Target Groups

Nutrition and health policies can only raise the income levels of the lowest income groups if, in fact, the benefits extend to them. Yet the poor are by no means a homogeneous group, and being widely dispersed they often prove difficult to reach.

An expenditure rationale which orients itself to improving the nutri-

tional and/or health well-being of the poor must utilize some definition of poverty. Poverty can be measured by both relative standards, such that economic inequality is emphasized, or by absolute standards which emphasize economic insufficiency. Despite the implications of a relative approach inherent in the notion of income distribution, it is, from the nutrition/health perspective the absolute poverty -- the economic insufficiency -- which is of primary concern. One would hope to identify some income level below which a family could not be expected to afford an adequate diet or adequate medical treatment. This level would vary from location to location and would not necessarily be equivalent to the lowest two deciles or the lowest four deciles of the income distribution. Nor would it need conform to some arbitrarily selected poverty standard. As the British poverty researcher Peter Townsend has noted, "To establish a minimum income standard is meaningless unless we also show that there are some families with that income who do in fact secure a defined level of nutrition. This fundamental criticism could be made of nearly all studies of poverty."<sup>11</sup>

Given the diversity of the lowest income groups, in terms of geographical location, environmental context, and ethnic and cultural background, it is operationally valuable if not essential to determine which subgroup within an income stratum will derive benefits from a given program. The urban poor and the rural poor, for example represent quite different target groups. A health program aimed at urban slum dwellers will face very different logistical constraints than one directed at scattered peasant communities in a mountainous area. Whereas the former may be successful in reaching the low-income groups, the latter may not.

Where government policies do effectively improve the health and nutritional status of the poor, a series of multiplier or indirect benefits can be postu-

lated. The benefit most often associated with such improvement is an increase in the productive capacity of low-income workers. This in turn may lead to higher productivity per se and hence increased incomes where worker productivity is a limiting factor in the production process. Whether this represents a net developmental asset, of course, will depend on the effect of such increased productivity on total employment. Should productivity and income of the poor increase without exacerbating unemployment problems, purchasing power would increase, and assuming adequate supply, nutrition and health status would be further boosted.

An additional area for speculation are the possible external economies produced by higher returns to education and family planning. Improved nutrition of the very young child not only will prevent biochemical deterioration of the brain but is likely to increase the child's access to social and emotional stimulation with consequent effects on learning. Similarly the attentiveness, motivation and attendance rate of school children may be improved by better nutrition and health. Family planning efforts may be more successful where infant and child mortality is reduced, and parents feel less need to over-compensate for expected child losses. In both cases, family income might be increased in the long run by higher earnings of educated offspring, and the reduced expenses of fewer children.

## II: A THEORETICAL FRAMEWORK FOR POLICY AND PROGRAM DETERMINATION

Health systems in most low-income countries follow a pattern originating from Europe and North America. The system revolves around the physician who, in turn, has been trained in a perspective inherited from the West: that of viewing ill-health as the outcome of specific diseases of a biologic origin. Medical programs, accordingly, place emphasis on treatment of the biological disorder. Malnutrition is considered a specific disease state resulting from dietary deficiencies; treatment consists of the provision of those essential nutrients combined with appropriate medical care.

As valid as this bio-medical, bio-nutritional approach may be in the care of disease, it is unsuited to health and nutrition planning, and to the formulation of policy. From a broader perspective, ill-health and malnutrition are the outcome of a multitude of environmental, socio-economic, cultural, religious, agricultural, demographic and psychological variables. Affecting potable water supply in combination with improved personal hygiene, increasing or reorienting agricultural production, or raising incomes may be more effective means of combatting ill-health and malnutrition than a traditional health center program or a school-based feeding program.

Thus in formulating policy a socio-medical, socio-nutritional approach is required. An attempt must be made to identify the determinants of the problem, or stated differently, the constraints that inhibit improvements in health and nutrition. Once these constraints are identified, the relative costs and effectiveness of alternative policies and programs designed to alleviate them can be examined.

### The Constraints Model

Detailing the many variables that contribute to malnutrition and ill-health can as easily lead to confusion and controversy as to concerted policy. In the nutrition field, for example some argue in favor of feeding programs, while others advocate nutrition education or maternal-child health centers. There has been a tendency for agricultural experts to promote increasing agricultural yields, for clinical nutritionists to promote rehabilitation centers, for marketing and business professionals to promote commercially produced nutritious foods -- all in response to the same problem: malnutrition of the population, or, more specifically, of the vulnerable groups. Yet there have been few systematic studies of the relative importance of the various determinants of malnutrition in specific locales, and even fewer evaluating the effectiveness of nutrition programs in affecting these determinants.

The debates of "education vs. income," of "medical care vs. feeding programs" and of "health centers vs. sanitation" might be better dealt with if a conceptual model of the limitations or constraints inhibiting the improvement of health and nutrition were devised. While the number of variables that collectively comprise the "ecology" of malnutrition and ill-health are numerous, it is possible, for policy purposes at least, to condense these into four primary categories of constraints:

1. local availability of essential inputs
2. adequacy of family resource command
3. socio-cultural factors
4. nutrition-infection interactions

This constraints model suggests that the pattern and priority of constraints -- and hence of appropriate policy instruments -- may differ from country to country, from community to community, from one socioeconomic group to another. Yet in analysing health and nutrition in low-income countries, certain overall patterns emerge. These are best presented by applying the model to malnutrition and health separately, although, of course, the fourth constraint level emphasizes the synergistic interaction between the two. Health policies which do not take into account nutritional deficiencies will not be wholly effective, and vice versa.

#### The Model Applied to Nutrition

The model seeks to identify constraints in the flow of food (calories and nutrients) which result in inadequate consumption, especially by the "vulnerable" groups whose calorie/nutrient requirements may be proportionately elevated. In particular the young child and the pregnant and lactating mother are considered nutritionally at risk.

With national food supplies as the given, the four constraint levels are as follows:

1. Local availability of essential inputs

Either the quantity or the quality (in terms of vitamins, minerals or protein) of food available may be insufficient at the community level. In particular, seasonal shortages may develop, and may be accentuated by adverse climatic conditions. The availability constraint may in part be attributable to underdeveloped transport and distribution systems, leading to isolation of

communities which are of necessity more self-dependent for food production, and thus more vulnerable to environmental factors.

## 2. Adequacy of Family Resource Command

In an urban monetized community family food consumption may be limited by purchasing capacity, which in turn will be a function of income, food commodity prices, and the cost of other budgetary demands. In a traditional rural environment, family food supplies will include self-grown crops and foods obtained by barter or purchase. The encroachment of "modernity" is essentially the encroachment of an exchange economy, which is highly monetized, on a traditional economy, which is not. In response to needs for cash, the farming population may 1) offer self-grown foods for sale at the market place, 2) shift to cash crops for sale, 3) seek rural wage employment, or 4) migrate to urban areas, perhaps on a seasonal basis, to obtain employment. Thus family resource command will be a function of such factors as land ownership, tenancy arrangements, employment opportunities, wage rates, and relative prices. Where this constraint is limiting, family food supplies will be inadequate, regardless of local food availability.

## 3. Socio-cultural constraints

Not only are family food purchases in large degree influenced by cultural preferences, beliefs and taboos, but intra family food distribution may be markedly affected. In some societies, emphasis may be placed on the adult male as household head, to the neglect of pregnant and lactating women and young children. Even where overall family food access is sufficiently high (due to local availability and adequate resource command), malnutrition problems often remain, particularly among the vulnerable groups which usually are the focal point of food taboos and nutrition-related belief patterns. Migra-

tion to urban areas and exposure to mass media need not lead to nutritionally improved patterns: witness the marked decrease in breast feeding in urban areas, with the attendant increase in gastro-intestinal disease and malnutrition among infants and children.

#### 4. Nutrition-infection interactions

The interrelations of disease and malnutrition have been well documented. On the one hand, malnutrition increases susceptibility to disease, and on the other, disease, particularly diarrheal disease and intestinal parasites, leads to increased nutrient loss and greater nutrient requirements. Thus even where adequate food is available one may not be able to utilize it sufficiently due to disease. Moreover, many cultural dictates (constraint 3) specify that foods be withheld during certain diseases, thereby aggravating the nutritional difficulty.

It should be evident from this model that any policy directed at an inappropriate constraint will be of little benefit. If local availability is not an important constraint, improved local yields in an agricultural community may not have any nutritional impact unless it simultaneously increases the resources of the poor or reduces food prices. Similarly improved income will not benefit socio-culturally constrained families, nor will nutrition education assist those who are too poor to be able to afford food in sufficient quantity or quality. Levinson's study on the determinants of malnutrition in the rural Punjab (India) found that while lower caste landless families were primarily constrained by inadequate income, the upper caste, landowning families suffered more from sociocultural constraints (especially nutritionally inappropriate belief patterns). "Most interventions which did not in some

way augment real income would have a far greater positive effect on the Jat [upper caste] child than on the Ramdasia [lower caste] and have the ultimate effect of widening existing differentials."<sup>13</sup> In Northeast Tanzania, on the other hand, Kraut observed that differences in nutrition could not be attributed to income or social standing, and that "the supposition that an increase in income automatically brings about an improvement in nutrition is inadequate."<sup>14</sup>

### The Model Applied to Health

As is the case with nutrition, four levels of constraints can be specified as limiting improvements to health. To be inclusive, one should look at all essential inputs that contribute to health: uncontaminated water, sanitary housing and adequate shelter from the elements, hygienic food, etc. Although each of these might be analyzed according to local availability, family resource command, sociocultural factors, and nutrition-infection interactions and hence permit a broad-based approach to rational health-related resource allocation, the discussion in this paper is limited to the provision of health services per se.

With national health services as given, the four constraint levels are as follows:

#### 1. Local availability of essential inputs

The extremely skewed distribution of trained health personnel and health facilities is perhaps the most generalizable characteristic of health systems in almost all low income countries. These health systems are usually hospital-based and urban oriented, place major emphasis on the training of physicians, despite the higher relative cost, and give relatively little attention to

auxiliary and pre-professional health personnel. The distribution of physicians between capital cities and the rest of the country, indicated in Table 1, well reflects the disparities inherent in such systems. Similar disparities can be observed in hospital bed/population ratios. The problem of access in rural areas is exacerbated by poorly developed transportation systems. It was found in Turkey, for example, that in rural areas most persons traveled on foot to reach trained health personnel, whereas in urban areas most used motor vehicles or horses, donkeys and carts. The combined effect of slower rate of travel and increased distance resulted in the majority (52%) of rural dwellers taking more than three hours to reach health facilities, while only 10% of urban dwellers took so long.<sup>15</sup> This study, it should be noted, covered only those persons who actually had access to health facilities; it can be argued that most of the rural poor do not. Oscar Gish has calculated that over 40% of the rural population in many of the districts in Tanzania live farther than 10 km from any health facility. "It is important to note that 10 km represent, in practical terms, the catchment area of a dispensary or rural health center, as well as a substantial part of hospitals."<sup>16</sup> His conclusion, in which we concur, is that receipt of health care depends on proximity to a health facility, and that the rural population which has no such access may not receive health care at all. This, of course, does not take into account the treatment (effective or otherwise) provided by indigenous health practitioners. In rural Bangladesh, homeopaths, hakims, faith healers and other such personnel were found to outnumber doctors, nurses, and trained auxiliaries by about 7.5 to 1.<sup>17</sup> Similar patterns emerge elsewhere, suggesting that it is "modern" medical care which is unavailable, rather than any treatment at all.

2. Adequacy of family resource command

The cost of medical services -- particularly private practitioners -- places an inevitable burden on family income. The burden weighs most on the poor for whom it represents a larger proportion of total income. In Chile, for example, the unmet need for physician treatment, as assessed in a large scale nationwide survey, was found to be inversely related to income, even after correction for urban-rural differentials attributable to accessibility of services.<sup>18</sup> Moreover, in looking at total cases of unmet need, lack of adequate finances was the reason most frequently given for not obtaining treatment.<sup>19</sup> For the very poor even the seemingly innocuous fees levied at non-profit clinics and hospital outpatient services may be significant. In querying mothers in two Tanzanian villages on why more women did not attend an Under Five Clinic, Bornstein and Kreysler discovered a suggestive pattern: in the village where more men had work in a nearby tea estate, thereby earning a cash income, the cost of the clinic (20 cents) was not viewed as an important factor, while in the other village where this income avenue was not readily available, cost was considered the most inhibiting factor.<sup>20</sup>

3. Sociocultural factors

The continued use of indigenous practitioners and the reluctance to accept modern medical care have been subjects of much interest in anthropological and sociological circles. As mentioned above, it is a mistake to interpret data on the rural scarcity of health facilities and personnel as indicative of an absence of any treatment. Trained health workers in low-income countries are "not filling a vacuum, but are rather offering alternatives and supplements to long-established institutionalized and at least partially ef-

efficacious ways of maintaining health and coping with illness."<sup>21</sup> According to one hypothesis, use of modern medical facilities is a measure of relative acculturation. It seems relatively clear that such factors as religious adherence, ethnic origin, familial stability and organization, exposure to formal education and spatial mobility may contribute to or detract from motivation to use modern health facilities and personnel. Furthermore "social distance" may ensue between medical personnel and patients, given differing educational levels, socioeconomic backgrounds, and cultural inclinations. This distance is most pronounced in the case of the lowest income groups. While these class barriers may be most evident in tradition-bound rural areas, they also persist in urban areas as observed by Teller in Honduras.<sup>22</sup> Patterns of "dual use" of medical and traditional "healer" facilities often emerge in cities, particularly among lower socioeconomic groups.<sup>23</sup>

#### 4. Nutrition-infection interactions

The synergistic interaction of nutrition and infection has been noted. The policy implication is that where malnutrition and poor sanitation prevail, curative medical care may have relatively little community impact. The work of Scrimshaw, Gordon and others in Guatemala is particularly instructive. A program of relatively expensive preventive medicine and medical care in one village had no effect on the frequency of illness among children (though there were fewer deaths), while less expensive supplemental feeding of the pre-school population in a second village, without any other intervention, gave an appreciable but limited improvement in disease incidence.<sup>24</sup> Since malnutrition is most prevalent among the poor, medical treatment may be less capable of restoring normal health to low-income children. Moreover even if the lowest socioeconomic groups should receive health care equivalent to that of

higher income levels, this may be insufficient, given their greater needs. Such a situation was indicated in the health utilization survey in Chile: "Apparently the more affluent found it possible to satisfy a relatively larger portion of their limited felt need for care, so that their utilization rates were remarkably similar to those of other income groups who needed more health care but frequently failed to satisfy such need."<sup>25</sup>

In conclusion it is apparent that government policies which seek to promote more equitable health care will be effective only to the extent that the appropriate constraints are addressed. The health plight of the lowest income groups, especially in rural areas, is not due solely to availability, or to family income or to sociocultural constraints, but rather to a particular mix that will vary from country to country, and from locale to locale. In attempting to determine whether health policies effectively redistribute "health benefits" to the lowest income groups we are faced with a complex and heterogeneous situation. Nonetheless, if health services are not locally available, other constraints remain irrelevant. A first step, then, must involve the provision of services. Yet care must be taken not to exacerbate the family resource (income) constraint in the process by unnecessary fees. An alternative policy measure, probably more relevant in urban areas of countries with reasonably well-developed administrative structures, may be the provision of health insurance, particularly to low-income groups and the unemployed.

### III. TRENDS IN NUTRITION POLICY AND PROGRAMS: AN EVALUATION

Interest in nutrition at the governmental level initially took the form of institutional child feeding programs. Indeed such programs continue to command upwards of 95% of all budgets directed to child nutrition in low income countries.<sup>26</sup> Largely a response to offers of food aid from industrialized countries and multilateral agencies, these programs are attractive for a number of reasons. Primarily they had -- and have -- political appeal, being direct, highly visible and generally less sensitive than other forms of foreign aid. Berg estimates that they reach about 125 million children in about 100 countries.<sup>27</sup>

Additional governmental nutrition efforts include food fortification, the encouragement of processed nutritious foods, nutrition education, and support for research efforts to improve genetically the nutritional value of staple food grains. These and other nutrition-related programs are considered in this section as alternative policy instruments of broader policies designed to redistribute income to the lowest socioeconomic strata. Yet, ironically, although nutrition programs often have been justified as assistance to the poor, only scattered attempts have been made to ascertain their effectiveness in reaching the lowest income groups in a meaningful way.

In the absence of much quantitative research, it is difficult in a review paper of this sort to specify with any precision the redistributive potential of the various programs and policies. Based on the constraints model, however, certain qualitative characteristics emerge. In particular we will examine existing policies and programs in the light of four fundamental queries:

1. Are the lowest income groups reached?

2. Is the appropriate constraint(s) addressed?
3. What is the nature and magnitude of the redistribution, if any?
4. If appropriate modifications could be made, would further expansion of the program be a viable approach to income redistribution?

Following evaluation of direct nutrition programs per se, other equally important nutrition-related policy areas will be briefly discussed.

#### Specific Feeding Programs

Programs with child feeding as the primary objective include a) school feeding programs, b) preschool feeding programs, and c) take-home feeding programs. Those integrated programs which utilize feeding but have additional or alternative objectives such as nutrition or health education are discussed in the section to follow. Adult feeding programs, while adopted by certain industries, have not received large governmental support, except in famine situations.

Of all these programs school feeding is by far the most prevalent and well established. At least two factors account for this emphasis: 1) when feeding programs were initially developed, particularly in the early post-World War II years, it was not realized that malnutrition exerts its greatest damage on pre-school-age children, especially in the range of 6 - 24 months, and on the unborn child of the last trimester of pregnancy; and 2) the school system is perhaps the most-widespread institutional vehicle through which feeding programs for children can be channeled. The fact that school attendance and performance may be positively affected offers additional appeal. The development of school feeding in the United States and Europe made this the natural route to go when surplus commodities became available for overseas programs.

Of low income countries, the most extensive feeding programs are to be found in India, where, prior to the Indian economic crisis of the early and mid-1970's, and cutback of U.S. PL 480 food provision, roughly 17 million people were fed daily.<sup>28</sup> Mid-day meal programs for school children, which alone covered 12 million children daily, were largely supplied by PL 480 (Title II) food donations through CARE and other voluntary agencies. Administratively these programs are operated by state education departments: another Special Nutrition Programme which aims at mothers and preschool children in urban slums and tribal areas, and now covers roughly three million children daily, is operated by the central government Department of Social Welfare. Clearly the budgetary expenditures are sizeable. The Fifth Five Year Plan calls for a nutrition allocation of slightly over four billion rupees (\$440 million) of which 3.5 billion is earmarked for feeding programs. And this does not take into account an estimated two billion rupees worth of foreign food contributions which are anticipated.<sup>29</sup>

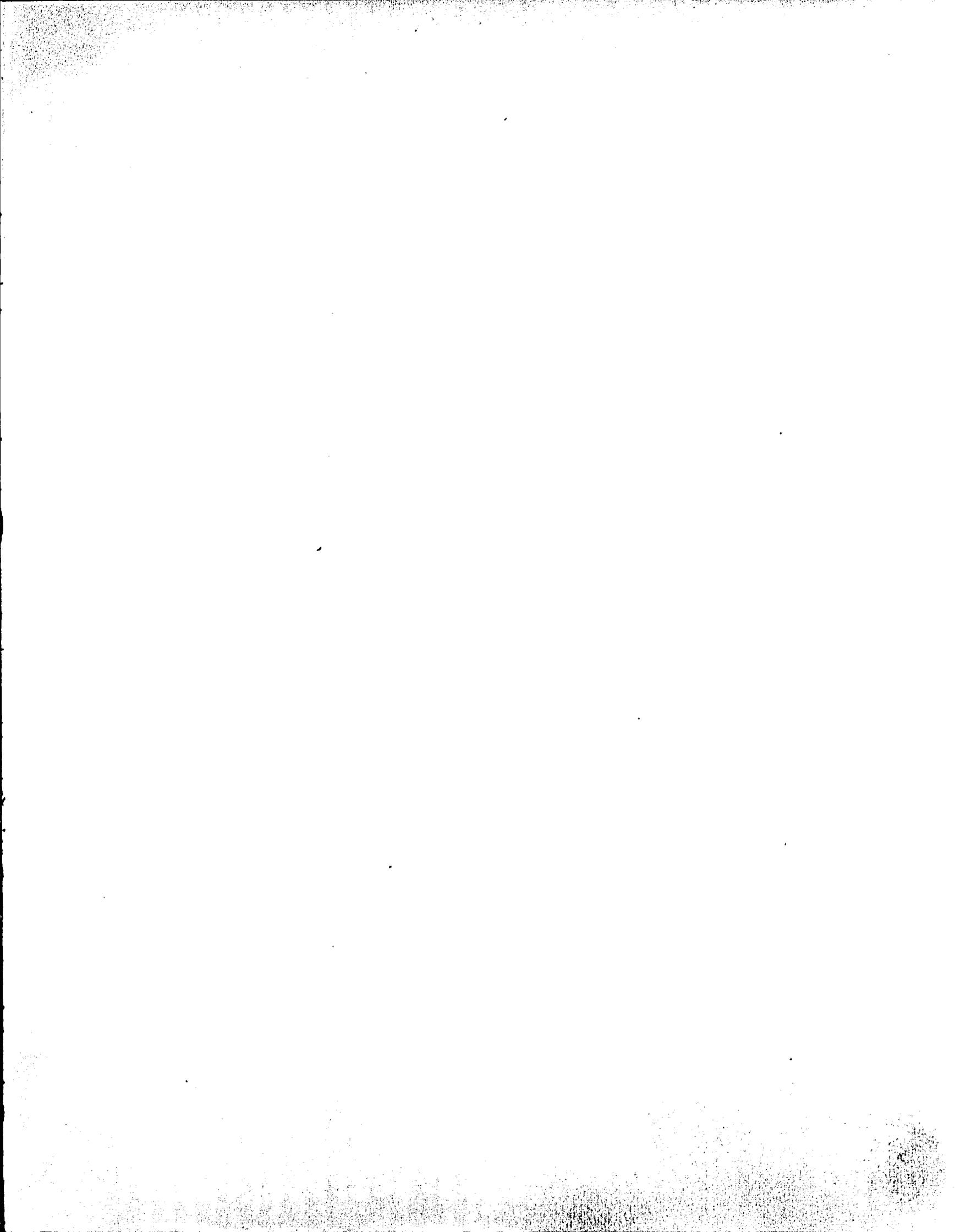
Thus child feeding programs might represent a significant income transfer -- if the lowest income groups are reached. Davidson Gwatkin, in a report to the Ford Foundation, makes a "guestimate" that in India 10 - 12% of the target recipients are served by the various programs put together.<sup>30</sup> Yet there is little information on the socioeconomic groups actually benefiting, or of their urban-rural distribution. Alan Berg observes that "schools in poor, remote villages are the least likely to have feeding programs; and for that matter, the poorest communities -- and states and nations -- are the least likely to have programs."<sup>31</sup> Moreover, "in most countries the size and location of the programs are planned not only on the basis of need but also on the availability of administrative skills and other resources necessary to carry out the program."<sup>32</sup> There are exceptions of course which prove the rule, such

as the school lunch program in the Indian state of Orissa which apparently serves about 70% of schools in predominantly tribal districts, compared with 25 - 30% of schools in non-tribal districts.<sup>33</sup>

As important as the location of school feeding programs is the pattern of school attendance. If children from low income families do not attend, perhaps because they cannot afford school fees, or because they are needed at home they will not be reached by the feeding programs. In effect, the less poor and middle income groups are likely to be the recipients of the income transfers -- not the lowest income and remote rural groups.

A similar situation was found in pre-school programs in the Indian state of Tamil Nadu, where coverage of the target pre-school population by all maternal-child feeding centers (including day care centers) operated or supported by the state government was about 12% in 1972.<sup>34</sup> A detailed study of the balwady (day care) programs revealed that almost all of the enrolled children lived within a radius of one-quarter to three-eighths of a mile from the center. "This becomes a critical factor in terms of the (Government of Tamil Nadu's) stated intention of operating balwadies for the benefit of the disadvantaged groups. As long as the physical location (of the) balwady is ...dependent on local voluntary effort, the government (has) no assurance that in fact the (program) is capable of enrolling those children who are most in need of the services."<sup>35</sup> In fact, centers were almost invariably in the main village, while the lowest socioeconomic groups (the scheduled castes) often lived in colonies physically separate from the village proper. Given the predominant influence of the upper and landed castes in village decision-making, it is not surprising that these day care programs, with their attendant feeding activities, were located to the advantage of the more well-to-do.

Take home feeding represents another distribution design geared to



the age of 15. Although the cutoff age of 15 was far higher than necessary, and although the expensive choice of milk was illfounded economically and nutritionally (it may have accelerated the trend toward early cessation of breast feeding) if not politically, the program in Chile as in Cuba, almost certainly resulted in major nutritional and real income benefit to the poor.

In terms of the constraints model, feeding programs can be viewed as addressing the availability and/or family resource constraints: on the one hand unavailable food (e.g. milk in sufficient quantity) may be supplied, and on the other the food is a supplement to family resources. In some instances children may be induced to eat what their parents would not otherwise be willing to feed them, thereby addressing a sociocultural constraint (discussed in more detail in the next section). From a nutritional perspective, the income increment represented by food will be valuable only if the food received by the child supplements, rather than supplants, his normal diet at home. Supplementation is most likely to be the case where parents are unable, due to the resource (income) constraint, to feed their child as they wish, and is least likely to be the case where the parents do not realize that inadequate diet is interfering with the child's health and development. Feeding programs, therefore, will be most effective where malnutrition is primarily a function of poverty. Yet, as shown, due to limitations in the methods of distribution, the poor are the least likely to be reached -- except, in situations like Cuba and Chile, where the government has a strong political commitment to assure its success.

In the absence of such major political commitment (which probably must be part of a broader development program with a high premium on equity) feeding programs can be expected to redistribute income primarily to the middle income and less poor groups. The magnitude of the redistribution may not be as great as enrollment figures and budgets suggest, however, due to inefficiencies,

wastage and misrepresentation. In Tamil Nadu, attendance at balwadies was found to be, on average, about 75% of enrollment figures.<sup>39</sup> Moreover, food loss resulting from inadequate packaging, infestation, rancidity and black-marketing can be considerable. For the recipient family, the income supplement and the nutritional benefits will be diminished by irregularities in feeding and irregularities in attendance.

Clearly the priority need in child feeding, aside from the pre-requisite need to make it domestically self-sufficient, is a reorientation both toward children who are younger (including their mothers during pregnancy) and those who are economically disadvantaged. Unless those children in greatest need are reached, the program may simply create the erroneous impression that the problem is being addressed. This, in turn, could well have the unfortunate effect of defusing the political pressures necessary to generate effective redistributive policies and programs. John Mellor has stated this view succinctly:

"I have two objections, then, to massive food distribution programs. First they may be inefficient in achieving their objectives. Second, there is danger of their being used to divert attention from the basic problem of insufficient income and food and toward ineffective but flashy palliatives. While 30 percent of the population in a low income country may need major nutritional assistance, a nutrition program is likely to reach only a small proportion of them. It may make the rich feel good that they are doing something for the poor, when what is really needed is for the rich to go along with the kinds of development programs that will expand employment, incomes and consumption of the lower income classes. However, the latter course very often involves much more substantial social, political and economic change than the rich are willing to tolerate and certainly much more than is involved in most of the nutritional programs put forward."<sup>40</sup>

In the event of famine, of course, different considerations come into play; mass feeding efforts are perhaps the sole means of addressing the problem of local unavailability of food.

Nutrition Education and Integrated Programs

Nutrition education programs address socio-cultural constraints; the basic assumption is that necessary resources are available and that family resource command is adequate, but that these resources are not properly utilized, or not properly allocated within the family. Typically these programs encourage the use of high-protein foods or foods of high vitamin or mineral content, endeavor to educate mothers in nutritionally sound child feeding and child care practices, and teach hygiene. To the extent that the last of these instructions is successful, the fourth constraint level (nutrition-infection interaction) may also be affected. In some programs the education is combined with feeding, health care, or both. Hence the reference to integrated programs.

The various programs include: 1) "Applied Nutrition Programs," 2) nutrition rehabilitation centers, 3) programs based in maternal-child health (MCH) centers, and 4) under-five clinics. Of these, the Applied Nutrition Programs (ANPs) are the most widespread and the most numerous, being for the most part the product of concerted United Nations efforts (FAO, WHO and UNICEF). By 1967 it was reported that ANPs had been initiated in 57 countries,<sup>41</sup> and in the period 1967-1970 further programs were formed in 20 countries.<sup>42</sup> In India alone the ANP has been implemented in 833 blocks (1971), with greatest assistance coming from UNICEF (7.24 million dollars in the form of supplies, equipment and other assistance by December 1969).<sup>43</sup> Nutrition rehabilitation centers (sometimes called mothercraft centers although to some there is a conceptual difference), have been set up in at least a dozen countries, mostly in Latin America; in Colombia, Guatemala and Haiti they constitute large scale efforts.<sup>44</sup> Under five clinics are found in a number of African countries. The incorporation of nutrition education into MCH centers varies considerably, and usually represents

good intent rather than established norm.

While each of these programs attempts to incorporate nutrition education objectives, the particular approach varies, not only between the types of program, but also within programs themselves. ANPs involve education through demonstration projects, including cooking, gardens, fish ponds and poultry production, and may include feeding programs; they often are school-based. Nutrition rehabilitation centers provide daycare (and in a few cases overnight) facilities for children diagnosed as malnourished; while the health and growth of the children are being restored through feeding and necessary health care, the mothers undergo training in nutrition education. MCH centers attempt to provide nutrition education in addition to regular health treatment. Under five clinics are child-care centers (sometimes mobile) that provide medical services, nutrition education and free food.

As an instrument of income redistribution, nutrition education programs cannot be highly significant. Most basically, the programs do not directly address the income constraint which one would expect to be operative among the poor. Moreover, the institutional base of many such programs fails to reach low-income groups. The fact that these programs have not been highly successful in altering community dietary patterns is perhaps indicative. In India, an evaluation of the ANP found no significant difference between villages in which there were ANPs and control villages, with respect to consumption of the nutritionally desirable commodities promoted by the program. Nor was any special consideration in ANP villages given to the dietary needs of the vulnerable groups.<sup>45</sup> In part, this was due to limited community impact: "Seventy percent of households in the 30 (studied) ANP villages had neither heard of ANP nor did they know anything about its aims and objectives. Not even one percent knew that it was a coordinated programme of nutrition education, production, and

consumption. Instead most of them referred to ANP either in terms of a feeding or health programme."<sup>46</sup> This latter observation in itself may be revealing -- almost certainly it is the physical real income transfer (of food or medical care) which is valued most by participants. At an under five clinic in Tanzania it was found that free distribution of medicines and food were the most appreciated activities. "It is noteworthy that no mother mentioned health education amongst that most highly appreciated clinic activities."<sup>47</sup>

In that nutrition rehabilitation centers feed and offer medical care selectively to the severely malnourished, they do have redistributive potential. Yet in the observations of Warren Berggren, who was instrumental in establishing the program in Haiti, poor families are reluctant to bring their children to the centers, being apparently embarrassed to publicly display their impoverished, poorly clothed condition.<sup>48</sup> This difficulty was overcome by active recruiting of the malnourished and by provision of clothing to the children. Once enrolled, the low-income children had good attendance records, however.

Even so, it is not clear that the nutrition education components will bring about long term benefits: in an evaluation of nutrition rehabilitation centers in Haiti and Guatemala little improvement was found in the growth of treated children one year after discharge.<sup>49</sup> "Perhaps NRC's should concentrate their educational efforts on families where children have malnutrition because of ignorance of the mother rather than because of the very low economic status of the family."<sup>50</sup>

At least in terms of distributional considerations, it seems relatively clear that programs with nutrition educational objectives should be combined with efforts to address the family resource constraint. Thus a recent report to the Indonesian Government emphasized that such programs should be located in areas where employment- and income-generating projects are under way.<sup>51</sup> In

and of itself, however, nutrition education cannot be viewed as a means to redistribute income to the poor.

Mention also should be made of the use of mass media for nutrition education, although few if any nationwide efforts have been launched. While the cost per contact made may be effectively reduced by this means, it probably is not an effective way of reaching the poor given that they are less likely to be literate and less likely to own radios than the more well-to-do. In addition, the scattered and diverse (culturally and linguistically) rural populace will be more difficult to reach as the same message may not be appropriate for all: in Zambia a recent mass media effort was concentrated in the urban and more densely populated areas. The potential effectiveness of mass media in reaching those in need almost certainly lies in the development of media which require neither literacy nor the purchase of receivers and which are logistically capable of reaching the rural poor (Mobile movie vans are sometimes attempted). In addition their effectiveness appears to depend on complementary efforts to disseminate the same messages in person.

Perhaps the most promising integrated programs are those in which primary decision-making resides in the community. The potential for effective decentralized decision-making which can positively affect the poor, rather than simply reinforcing the power of local ruling elites, surely varies considerably among low income countries, and relates not only to the political orientation of the government but also to prevailing social dynamics and community cohesiveness. Nonetheless in several socialist countries, and on a more limited scale in Colombia, Central America and Pakistan, there have been examples of community-managed nutrition and health programs usually with some referral relationship

to the hierarchical government health system. In the case of nutrition, communities themselves select local personnel who, after a very brief training period, assume responsibility for home visiting and a monthly or bi-weekly weight surveillance program to identify immediately young children at risk. For the child who deviates from the growth curve, the worker may provide information or weaning food, or where complications arise refer the family to the appropriate government health service.

#### Commercial Nutritious Foods

Since the formation of the Protein Advisory Group at the U.N. in 1955, considerable attention and effort has been directed toward alleviating the "protein gap." Some of this attention has taken the form of efforts to develop and commercialize low cost "protein-rich foods" usually through the private sector. In a comprehensive analysis of these efforts,<sup>52</sup> Elizabeth Orr describes 69 schemes in 36 countries, a number of which have been discontinued. Aside from 15 schemes in which the responsible enterprise was owned in whole or in part by the government, government aid has, in general, been restricted to purchase

of product (often for use in feeding programs), and to assistance with promotion. The largest volume of production has been achieved by Bal Ahar (26,500 tons in 1969), a product of the government-owned Food Corporation of India.

These foods have been distributed both through institutional feeding programs and through the commercial market. Given the costs associated with milling, processing, packaging, transportation and advertising, the commercially marketed high protein foods have been more expensive than locally produced traditional foods. Thus, while usually<sup>4</sup> beyond the purchasing capacity of low income groups, they may if purchased by the poor, replace other food purchases. This may not always be nutritionally beneficial. Popkin and Latham have illustrated how "by buying a package of a commercial food the poor may pervert in the process their overall food budget. The replacement will all too often result in the availability of less protein, less calories, and less other essential nutrients in their overall food budget."<sup>53</sup> This replacement phenomenon will be especially prevalent among the urban poor exposed to the powerful influence of advertising; the rural populace, less in touch with the market mechanism, will be less affected.

Processed nutritious foods cannot be considered a redistributive instrument unless prices are reduced through government-provided consumption subsidies. At significantly lower prices these foods may come within the purchasing capacity of the poor, and diminish the replacement effect so that the overall ratio may be beneficial (more nutrients per unit expense than in the traditional diet). Although unlikely to be useful in rural areas, such programs may have a beneficial distributional effect on the urban poor particularly if these subsidized foods, aimed at the vulnerable groups, are distributed through existing rationing systems, as is presently being considered in Pakistan.

Unless accompanied by such consumption subsidies, the benefits of commercial protein food distribution will accrue to middle and upper income groups. Hence governmental assistance would in effect heighten relative disparities between the poor and the more well-to-do as far as nutritional well being is concerned. Institutional distribution may in some instances benefit the lowest income groups, though within the limitations discussed with regard to feeding programs.

#### Food Fortification and Genetic Improvements

Food fortification efforts take the present consumption patterns as given, and attempt to introduce nutrients in which the diet is otherwise deficient. As such, neither local food availability, nor family resource constraints nor sociocultural factors are directly addressed. Rather the constraints are bypassed - in theory fortification represents a simple, direct and inexpensive means of improving nutritional well-being where particular protein (or amino acid), vitamin or mineral deficiencies are prevalent.

Although attention in the past has been focused primarily on the additives themselves or on the particular vehicles used (particularly cereals), there is today increased recognition that programs must focus on appropriate target groups. For example, different age and income groups will consume different foods in different proportions. Fortification of a food included only in upper income diets will not help children of low income families. An example is wheat and rice fortification in areas where the poorest eat millet and sorghum since it is less expensive.<sup>54</sup>

The fortification concept poses an additional problem in reaching the low income groups. Fortification is logistically possible only where the vehicle is centrally processed: when cereals are milled in a multitude of village grinding units, or when foods consumed are home grown, the fortification approach can't be utilized. Yet certain vehicles such as salt, sugar and tea, consumed by the population as a whole may be highly effective carriers where these are centrally processed. Even the rural poor, who are difficult to reach by market distribution, usually consume these items regularly and hence would benefit directly from their fortification. The results can be dramatic. In the goiter belt of northern India, a program of salt iodization reduced the prevalence of goiter among those reached from 36% to 3% in ten years.<sup>55</sup> The Governments of India and Indonesia are considering the fortification of salt with iron, a measure of enormous public health potential. In Costa Rica and Guatemala the Governments recently passed legislation requiring the fortification of all sugar with Vitamin A, and in Pakistan, the Government is considering nationwide fortification of tea with Vitamin A.

For rather minimal cost, the magnitude of benefits (reduction in the incidence of blindness due to vitamin A deficiency, increased physical capacity and possibly productivity with a reduction of iron deficiency anemia, prevention of goiter and in extreme cases deaf-mutism and cretinism by reducing iodine deficiency) may be substantial. Unfortunately, the fortification of unconventional carriers (sugar, salt and tea) is still very much the exception rather than the rule. There also has been some reluctance by governments to subsidize the

cost of the fortification, although the expense involved usually is not high relative to other health-related expenditures. If the lowest income groups are to benefit, such additional costs will have to be assumed by the government - or, in some cases, absorbed by the processor. These subsidies can be considered redistributive measures, in that they will have their greatest effect on the poor. In some cases it is possible to go even further, in a distributional sense, by fortifying only items or grades of commodities consumed by the poor. The fortification of "flour mill atta", a low grade form of wheat shunned by middle and upper income groups in South Asian cities (actually much of this wheat is imported from the U.S.) is such an example.

Another potentially attractive instrument is the genetic manipulation of the nutritional content of cereal strains. As in the case of fortification programs, the constraints themselves are minimally addressed (unless one argues that nutrient availability is increased). Yet unlike fortification, the effort and expense is not recurring once an improved strain has been successfully introduced. Most of the work to date has concentrated on corn (Opaque 2), sorghum and wheat and has attempted to increase their protein content or improve their amino acid profiles. Where protein deficiencies exist independent of caloric needs ( a question of raging international controversy among nutritional scientists, but surely one with no universal answer), and where these staples are consumed by the poor and the vulnerable groups, the plant breeding approach will have considerable appeal.

While conceptually attractive in benefiting the rural poor who are difficult to reach through most commercially distributed forti-

field foods, large scale utilization of cereal strains with high nutritive value is still many years off. Important problems of yield reduction, disease susceptibility and consumer acceptability still have to be overcome. If they can be, they offer major promise for nutritional improvement, and a means to address at least part of the malnutrition problem of the poor.

#### Nutrition-Related Policy Areas

That family resource command is a limiting constraint to improvements in nutrition for the poorest groups in many if not all low income countries has been observed repeatedly in this presentation. Obviously, then, any government policy which increases the incomes or wealth of the poor may be nutritionally beneficial; conversely, policies which undermine their economic base may be nutritionally detrimental. Such measures as employment generation, wage increases, improved tenancy relations, redistribution of land, increases in small farm yields, extension of credit to smaller farmers - in fact all policies and programs that redistribute income in favor of the poor, as discussed in other presentations at this conference - may lead to improvements in nutrition.

Government price policies are of particular nutritional significance. Many less developed countries have used positive price policies as an incentive to producers: higher food prices serve to redistribute income from the non-agricultural to the agricultural sector. Yet the greatest increases in income will be to those who sell more of their produce; the rural subsistence farmers who sell little will not benefit significantly from such a price policy. At the same time, low-income food purchasers - i.e. the cash dependent rural poor, the urban poor and, to the extent they

purchase from the market, landless farm laborers -- will have to pay higher prices, and hence may have to decrease their food consumption. "A rise in agricultural prices redistributes income away from low income urban consumers and towards high income agricultural producers."<sup>56</sup>

In the case of cash crops, the effect is different. Higher prices lead to higher incomes for the small cash-crop farmers, while the urban poor and rural poor are not hurt since these goods usually are beyond their purchasing capacity. At the same time, excessive zeal for higher production of cash crops has had the effect, in an increasing number of countries, of luring land away from the production of domestically consumed staples, thus decreasing their availability and increasing their price to the low income consumer (who also benefits least, if at all, from the benefits of foreign exchange earnings from the cash crops).

Negative price policies which artificially depress prices favor consumers. But unless small farmers were able to increase output enough to compensate for the lower price, they would lose income. Urban and rural cash-dependent poor would benefit, unless scarcity conditions arise (due to unmet demand): "What is produced would probably end up in the hands of the well-to-do, who are usually better able to procure scarce commodities, unless a rigid program of distribution to low income groups were implemented."<sup>57</sup>

A final consideration must be given to relative yields and prices. One detrimental impact of the Green Revolution may have been a decrease in pulse production as farmers turn to more profitable cereal strains.

Again the losers are the poor whose income elasticity of demand for pulses considerably exceeds that of the wealthier groups. Today with higher pulse prices (up 40% in two years in Pakistan) and less fertilizer on which the new cereal strains are dependant, this imbalance may be redressed. The development of higher yielding strains of pulses, however, would help considerably in this regard with benefits skewed to the poor.

Call and Levinson suggest that discriminatory prices, by which the consumption of low income groups would be subsidized by the government, could improve the nutrition of the poor.<sup>58</sup> In spite of high costs (the Government of Pakistan spent \$100 million on a two-tier consumer pricing policy for wheat in 1973) and major administrative expense and commitment, such policies, which assure adequate amounts of essential commodities at subsidized prices, may represent the only effective means of translating production increases into improved consumption for the poor. Without it their nutritional needs, only a small portion of which constitute effective demand and hence are taken into account in agricultural supply projections, will continue to be largely neglected.

Trade policies can have a significant effect on nutrition, particularly where a large portion of food needs are imported, or where land use is oriented around export crops. Cash crops may be encouraged for export, to the detriment (or benefit) of nutritional considerations. Food imports influence domestic food prices, and thereby consumption. Conversely nutrition programs can influence trade: witness the milk powder imports required for government distribution programs in Chile.

It goes without saying that education can influence the social and cultural factors which in turn influence food habits and child feeding

practices. It also, at least conceptually, can affect productivity and future earnings, thereby addressing the family resource command constraint in the future.

The development of transportation networks -- roads, railroads, or water transport-- may also have significant impact on nutrition, not only by allowing greater access to markets (both for sale and purchase) but by enabling food to be transported into areas of scarcity. As Alan Berg notes, "the major contribution to the solution of regional famines in India appears to have been construction of the railroad."<sup>59</sup> Likewise, improved food storage can help balance out the seasonal fluctuations in supply.

Disaster relief measures themselves may bring not only short run relief but long-term nutrition policy gains. Thus the Bihar famine of 1967 and the emergency relief program dramatized to the Indian government the importance of nutrition: "The famine led to interest and in some cases emotional commitment, which in turn led to a variety of programs, a national nutrition policy, and a chapter on nutrition for the first time in the Five Year Plan."<sup>60</sup>

The importance of public health efforts -- improved water supply, sanitation, waste removal, infectious disease control, anti-parasite programs -- to name but a few, all impinge upon the nutrition-infection constraint and may bring marked improvement in the nutritional well-being of the malnourished.

Lastly, family planning efforts are interrelated with nutritional considerations. To the extent that family size is reduced, the availability per person within the family may be increased. It's also

possible that the success of family planning may depend on improved nutrition -- as long as infant and child mortality rates are high, a result of the interaction of malnutrition and disease, there may be little motivation for low-income parents to limit family size, given that children, especially sons, are important investments as future income earners. In fact parents often overcompensate for expected mortality to assure the desired number of sons. Needless to say, the initial impact of improved nutrition may be an increase in family size (due to increased survivorship), but this, it is assumed would merely represent a transitional phenomenon. Operationally there is increasing evidence of the value of integrating family planning and nutrition efforts, where both are being delivered through community-based centers or extension agents.<sup>61</sup> Where health and nutrition services are also provided, there usually is greater receptivity to the family planning message.

From this brief summary of related policy fields it is evident that nutrition planning must be an integral part of overall development planning. Indeed, the fact that the lowest deciles in the income distribution are often bypassed by the development process could argue in favor of nutrition considerations that could inject a greater concern for the poor. Evidence from areas which have witnessed rapid growth rates suggests that socio-economic growth without explicit attention to the malnutrition problems of the poor and the vulnerable population groups may well leave these groups marginally affected. At the same time, it is unlikely that nutrition policies alone will

provide viable long term benefits to the lowest income groups in the absence of related socio-economic improvements. The two are complementary and must be addressed in tandem if desirable results are to be achieved.

#### IV. THE DISTRIBUTIVE IMPACT OF HEALTH PROGRAMS

The skewed distribution of health care services can be viewed along at least two component axes: The urban-rural dimension, and the income dimension. Both the urban poor and the rural peasant tend to be bypassed by health delivery systems in low-income countries. Yet in terms of numbers of persons affected, there can be little doubt that physical inaccessibility of modern medical services is the first limiting factor. In Ghana, for example, "health facilities are so distributed that they cannot offer any kind of service to more than, at most, 20% of the population." <sup>62</sup> The rural health center system in Thailand reaches at most 6% of the rural population, although an additional 15-20% are able to use district hospital services. <sup>63</sup> Even where more effective rural health programs have been launched, as in Iran, only half the rural population may gain access to outpatient care. <sup>64</sup>

The emphasis of this section, accordingly, will be on the extent to which government health policies overcome urban-rural inequities. This is probably a more pressing concern and certainly a more decipherable situation than that of differential use of health services by income groups. Virtually the only studies of differential use by socioeconomic levels are a few utilization surveys (e.g. Chile, <sup>65</sup> Colombia, <sup>66</sup> , and scattered pieces of sociological research; as a whole the medical profession has been remarkably unconcerned with the need to collect information on the nature of its coverage. While Charles Teller may be accurate in his doubt that "a more equitable geographic distribution of health personnel and resources (alone) would be sufficient to

make a noticeable improvement in the medical care of the lower classes in most Latin American countries<sup>67</sup> given powerful social class barriers, equitable distribution is almost certainly a necessary, even if not sufficient condition for health improvement of the poor.

In the following pages, then, we will address primarily the problem of health facilities and personnel distribution, i.e. the "local availability" constraint.

#### Organization of the Health Sector

Patterns of health care delivery have varied widely from one low income country to another as a result of differing historical—and particularly colonial—experiences. While health care in some countries is organized and coordinated at the national level under an encompassing national health service, there is, in other countries, fragmentation and duplication of delivery systems, such that effective governmental control is minimal. Thus the mere observation that health resources are highly concentrated in urban areas does not, in itself, indicate whether this is due to governmental policies, or a lack thereof. It is therefore useful to look at the organization of the health sector in discussing the distributive impact of governmental health policies.

The degree to which a government is able to direct the allocation of health resources is dependant on the extent of governmental coordination of health-related delivery systems, and on the relative strength of the public versus the private health services. Experience has shown that the private sector usually represents particular interests rather than the needs of society as a whole. When the private services are particularly dominant in a country, they often dominate the public services, rather than vice versa.

The public and private sectors can be further broken down into various types of services, according to the pattern of ownership and the particular recipients serviced. While the organization of services in no two countries is likely to be the same, the following broad categories can be defined: ministry of health services, special government services, social insurance schemes, mission and charity services, industrial and agricultural enterprise services, private practitioners, and indigenous health practitioners. We will discuss each category briefly, with special reference to the population group being served.

#### 1. Ministry of Health Services

Although some countries, such as Cuba, have developed strong centralized national health services, ministries of health often have relatively little control over the delivery and distribution of services: "Although responsible for health planning, ministries of health in Latin America have had very little authority over medical care."<sup>68</sup> This may be due to the development of other governmental services, such as social insurance schemes in Latin America, or due to the predominance of mission and charity institutions (especially in Africa) or due to the strength of the private sector (as in Pakistan).<sup>69</sup> Even more decisive, the ministry of health may suffer from severe budgetary constraints. Yet for redistributive purposes, ministry of health services generally need both expansion and re-orientation, even if the ultimate goal may be community-based, decentralized control and decision making. Instead, all too often, resources are channelled into politically attractive (and also expensive) urban hospitals and clinics.

#### 2. Special Government Services

In low income countries, these usually include special services for the military and the civil service. In Latin America, for example, the military, and subsequently the police forces, regarded as important for the

maintenance of political and social stability, have enjoyed preferential access to health services, from early colonial times to the present.<sup>70</sup> Thus in Peru the armed forces and police own and operate 7 hospitals, thereby utilizing about 7% of the nation's hospital beds, 10% of medical personnel, and 17% of professional nursing personnel -- although the number served is less than 3% of the population.<sup>71</sup> The extent of coverage by such systems usually is limited, and biased away from the lowest income groups who are less likely to be employed in these services.

### 3. Social Insurance Schemes

A variety of social insurance schemes have been established, differing in extent of coverage and provision of services. Given the overall shortage of health resources, these schemes often own and operate their own facilities with their own personnel. In addition to direct patterns of health care provision, some schemes may also allow the purchase of services from the private sector. Social insurance schemes however, usually are limited to wage earners and salaried employees, and sometimes to the self-employed in urban areas. The programs for white collar salaried employees may be distinct from those established for wage earners, as is the case in Peru.<sup>72</sup> Social insurance schemes are most prevalent in Latin America,<sup>73</sup> but relatively rare in Africa -- over 30 of the independent countries of Africa are without them.<sup>74</sup> The few that exist in Asia usually are confined to the industrial and commercial sectors, and sometimes to only part of these. Thus the Employees' State Insurance Corporation in India is limited to employees in non-seasonal establishments of 20 or more persons in which a manufacturing process is under power.<sup>75</sup> In no case is the rural agricultural population significantly covered: "In many cases the law excludes the farming population; in others the coverage provided is restricted to wage earners; in others again the protection provided for by law remains a dead letter because the necessary administrative services are lacking."<sup>76</sup>

#### 4. Mission and Charity Services

Religious and humanitarian organizations have contributed significantly to the development of medical care in many low-income countries. The Catholic Church, for example, took responsibility for sickness among the poor in many Latin American countries, and a system of charity hospitals was established. By 1961, charity hospitals accounted for 40% of hospital beds in Peru, and provided the only readily accessible facilities for many communities.<sup>77</sup> Of prime importance, the religious hospitals often were constructed in rural areas, where the need was greatest; as they are unable to be fully self-supporting, these rural hospitals are dependent on government grants and foreign support for their continuance. In Africa, where overall health services are generally less developed, the mission hospitals are particularly significant: In Malawi they provide 2027 hospital beds out of a total of 8074; in Kenya 2207 out of 10,368 and in Ghana 1622 out of 7037.<sup>78</sup>

#### 5. Industrial and Agricultural Enterprise Services

In many countries the largest employers have established some medical facilities for the care of their workers. The Ivory Coast, for example, requires an employer with more than 20 employees to make a nurse permanently available and an employer with more than 100 to provide a first-aid post and a dispensary.<sup>79</sup> In Tanzania, enterprises employing more than 100 workers must provide regular medical care, and in Cameroon any plantation having more than 1000 workers must appoint a full-time doctor. "In practice, however, although the situation may be satisfactory in the larger undertakings, it is very difficult to ensure that the small and medium sized plantations comply with these standards!"<sup>80</sup> Nonetheless a substantial portion of privately owned hospitals may belong to industrial

and agricultural enterprises: in Peru 42% of private sector hospital beds are in this category.<sup>81</sup> Their coverage is limited, of course, to employees, and eligibility is retained only as long as they continue to work.

#### 6. Private Practitioners

Private practitioners usually engage in a fee-for-service practice and hence cater to the upper income groups, although some doctors also offer limited services to poor patients without charge. In general, the forces of effective demand - coupled, of course, with prestige and other benefits attract the private practitioner to the larger cities: in Turkey over two-thirds of full-time private physicians are located in Istanbul and 8 other large cities.<sup>82</sup> The rural areas are generally avoided. The proportion of physicians in private practice varies widely from country to country; moreover physicians in public service often augment their incomes through private practice. Oscar Gish has emphasized the importance of the private medical sector in determining utilization of public facilities:

"Where the private sector is dominant, ... the public sector becomes more an instrument of private medicine than anything else. The misdirection of public sector hospital beds, services and drugs toward private patients is a commonplace in all the countries of the Indian sub-continent. However, it is where the private sector is most dominant that these phenomena are most common; it is not unusual in such countries for the resources of publicly owned hospitals to be very substantially at the disposal of the senior hospital doctors' private patients." <sup>83</sup>

#### 7. Indigenous Health Practitioners

In most rural areas, indigenous health practitioners outnumber modern health personnel to a considerable extent and are the primary source of health care. While the quality of these practitioners un-

doubtedly varies considerably, not all are ineffective. Thus in China and India, there are "many traditional doctors who practice an empirical medicine and who are certainly not sorcerers or magicians; the Ayurvedic and Chinese arts of healing, for example, are effective against many symptoms and the drugs are very cheap."<sup>84</sup> In addition to traditional doctors, there are traditional specialists such as midwives, wound dressers, and bone-setters, as well as supernatural healers. While at the present virtually all such personnel (except in China) are outside organized health delivery systems, there is increased interest in the question of using them to reach rural communities with more effective health care. The former Director of Medical Services of Ghana has observed that "this resource, which has yet to be tapped, is likely (when properly harnessed) to help bring more of health as we understand it to the people of Ghana than can any orthodox medical practitioners."<sup>85</sup>

From this overview it should be apparent that a diversity of health care services exist in low income countries. It also is evident that the health care offered by government services, by social insurance schemes, by industrial and agricultural enterprise services, and by private practitioners are largely biased towards the urban dwelling, employed and the more well-to-do.

In that these systems concentrate services in urban areas, and generally bypass the lowest income groups, they actually augment income disparities between the participants and non-participants. With regard to social insurance schemes, Robert Savy observes:

"It is even more obvious (in Africa) than in Latin America that the benefit of social security is enjoyed by the privileged few. A minority of workers, in industry and occasionally in agriculture, are lucky enough to receive a regular income far

higher than that of the African peasant, and social security has assumed responsibility for guaranteeing this income against the ordinary contingencies of life, thereby emphasizing, rather than reducing, the disparities between the two groups. It is only now that we are beginning to realize that, paradoxically, progress in the social security field may be an obstacle to the achievement of greater social justice in the developing countries, and the implications will have to be clearly understood before adequate policies to eliminate the danger can be framed." 86

### Patterns of Health Facility Development

Inasmuch as health priorities in low income countries have been patterned after those in industrialized countries, it is no surprise that much emphasis and expenditure has gone into the construction and operation of hospitals in preference to health centers, whether in the private or public sector. In evaluating this trend,

a few salient points are worth considering:

1. Hospitals are best suited to high population densities.

In the rapidly expanding capital cities, there may be advantages in concentrating and centralizing limited resources in one or a few multistoried buildings. Yet in rural areas where the population is widely dispersed and transportation facilities poor, the net effect of concentrating resources is to isolate them, making health care unavailable to the majority.

2. The catchment area of any health facility is limited. In

rural areas, distance from a health facility is a major determinant of utilization. In Kenya it was found that 75% of admissions to hospitals and 95% of outpatients come from within a 25 mile radius. 87 Two surveys in Tanzania revealed that about half of rural health center outpatients came from within 7 or 8 km and a full 80% from within 15 km. 88 Moreover

when hospitals or health centers are located in cities or towns, a very large proportion of admissions and outpatients will come from that city or town.

3. The cost of hospital construction and operation is very high, relative to utilization. Oscar Gish estimates that for the same volume of expenditure that is required to build and equip a modest 200 bed regional hospital in Tanzania, it would be possible to build 15 fully equipped rural health centers, including staff housing:

"With 15 such centers it would be possible to meet most of the curative health care needs of approximately 300,000 to 0.5 million people, and to launch a wide variety of preventive health care activities. In Tanzania today at 15 such centers there are close to 15,000 admissions and 1 million outpatient visits per annum. At the regional hospital, by contrast, it would be possible to admit about 9,000 inpatients, a great majority of whom -- at least potentially -- could be treated as well at a health center (15 centers would contain more beds than a regional hospital), and a total of close to 400,000 outpatients, virtually all of whom could be provided for as well at a health center. The running costs for 15 RHC's in Tanzania are virtually the same as for one 200 bed regional hospital." 89

A consultant hospital, furthermore, might cost twice as much per hospital bed as a regional hospital. It is not unusual for the capital expenditures on a large capital city teaching hospital in Africa to be greater than the entire annual health budget of the country. <sup>90</sup> In Senegal 40% of the annual health budget is allocated to the large teaching hospital in Dakar, while in Guatemala 73% of hospital expenditures are devoted to hospitals in the capital city which represents only 15% of the national population.

4. Large city hospitals are more prevalent than smaller rural hospitals.

Table 2 indicates that the number of general hospital beds may be as much as ten times the number of rural or local hospital beds, especially in Latin

American countries which have relatively more total hospital facilities than most African or Asian countries.<sup>91</sup> The figures for total beds are somewhat deceptive when compared to government administered beds, however. Thus in Peru, although 87% of all hospital beds are in the public sector, only 35% are under the Ministry of Health;<sup>92</sup> in Ghana 23% of all hospital beds are in mission hospitals<sup>93</sup> and another fraction will be in hospitals operated by various industrial concerns.<sup>94</sup>

5. Large hospitals are more suited to the requirements of medical specialists. The larger hospitals are apt to be better equipped, more specialized (either as a whole or in terms of internal divisions), and more teaching/research oriented. With the growing numbers of highly trained medical specialists, the pressure for costly facilities increases. F.T. Sai, the former Director of Medical Services in Ghana, notes that in his country, doctors as a group "have actively misinformed the political leadership on the importance of hospital specialists and hospital equipment in relation to the total health needs of the people. This kind of misinformation, added to the politician's own desire to be identified overtly in the short term with visible results, has impeded reorientation of the health system."<sup>95</sup>

6. Health facility priorities are essentially political decisions. "The major influence on health-service policy in Ghana, up till now, has been political. This is true of all developing countries, and will probably remain true for the next ten or twenty years."<sup>96</sup> Hospitals are highly visible and likely to attract the backing of urban and governmental elites. A rural health center, on the other hand, is less visible and less politically attractive, although much more in accord with the needs of the majority of the population. In low-income countries experiencing socialist transformations, however, the

emphasis on rural areas is part of the political platform — be it in China, Cuba, or Tanzania. In Chile, emphasis shifted toward health centers with the election of Salvador Allende's Popular Unidad government but, apparently, reverted to hospital-orientation following the change of government. 97

From these considerations it is evident that emphasis on quality care — the highly equipped modern hospital — serves to further concentrate health resources in urban areas where they are of limited value to the rural poor. The much discussed referral system, that allows the referral of patients with difficult or demanding health problems to successively higher — and more specialized — levels of care has not proven effective in most low-income countries, given the neglect of rural health centers.

#### Health Personnel: Supply and Distribution

The medical graduate, as presently trained in most low-income countries, is poorly prepared to tackle the pressing health problems of rural areas. If not actually a graduate of a foreign medical program, the young doctor has been schooled in a medical education system patterned after a European model. In particular, the medical student is trained in such subjects as anatomy, physiology, and biochemistry, and accordingly views disease from a biomedical perspective. His public health exposure is minimal. Medicine becomes, for many, a field of scientific and intellectual interest, with higher status accorded to those who specialize and produce original research. In pursuit of these interests, and to obtain further specialty training, many medical doctors travel to Europe or the U.S. — often not to return. Those who do return are likely to pursue speciality practice, often in specialties largely irrelevant to the poverty-embedded populations of their countries.

Thus of 80 Ceylonese doctors who returned to Ceylon from study in Britain, there were only two specializing in nutrition or public health, while ten specialized in anaesthesia, ten in general surgery, ten in obstetrics and gynecology, eight in psychiatry, and six in eye surgery.<sup>98</sup> Many of these persons will insist upon sophisticated hospital facilities to continue in their speciality, while few will be willing to engage in rural work (see Table 1).

The extensive training of medical doctors, requiring clinical experience in teaching hospitals, is a costly business for countries with limited budgetary resources. The substantial loss of medical graduates from low income countries to the wealthier nations can represent a major economic drain. The loss from the Philippines is especially severe, but not unique among low-income countries: in 1968, the number of Filipino medical graduates who took the examinations required for full medical registration in the United States (ie. who planned to practice full time in that country) was equivalent to more than half the output of the Philippine medical schools in the same year.<sup>99</sup>

An educational system which is geared to produce doctors best suited for practice in the industrialized nations is certainly contrary to the health needs of the majority of the population in a low income country. Hence doctors must be coerced to engage in rural health work: in a number of countries medical graduates face compulsory rural service under ministry of health jurisdiction for one or a few years. In Tunisia new medical graduates are required to spend two years at a rural assignment;<sup>100</sup> in Iran medical graduates are drafted into the rural health corps rather than into regular military service.<sup>101</sup> While such steps certainly help to redistribute health resources to rural areas, they are an inadequate solution, since the doctors

almost always return to the cities at the end of the compulsory period.

An approach sometimes advocated is to increase the output of medical graduates so that doctors in the cities will become surplus, and will have to seek employment in rural areas. The most basic faults with this notion are 1) that medical graduates may prefer emigration to rural work, given their training and 2) that the process of filtering out to the countryside may occur so gradually (first large cities, then small cities, towns, large villages etc.) as to be insignificant relative to the pressing needs of the rural populace; the gains might not even match the rate of population growth. In countries where physicians are particularly scarce, as in many African countries, and must depend on foreign nationals to provide medical care, this argument seems especially out of place: while expansion of highly trained health personnel may be desired for other reasons, it is no solution to the problem of maldistribution. Mere expansion of medical schools in a low-income country is unlikely to have any redistributive benefit to the rural population.

Table 3 compares the ratios of physicians and other health personnel to population in a number of countries. The table reflects both the inadequate number of health personnel and the opposition of physicians to larger numbers of (and greater delegation of responsibility to) auxiliaries.

The alternative strategy is to train a select group of rural persons in some basic health skills and delegate to them major responsibility for primary care in rural areas. The most massive and successful example of this approach has been implemented in the People's Republic of China, where rural medical services were dramatically expanded beginning with the "Cultural Revolution" in 1965. Rural workers were (and are) trained in sanitation, health education, immunization, first aid, and some aspects of primary care and post-illness

follow-up; in the villages they serve as "barefoot doctors" able to deal with the majority of rural health problems.<sup>102</sup> There are now said to be over a million of these rural health workers.

over a million of these rural health workers. Numerous examples have been given to demonstrate the effectiveness of the approach to health delivery in China. Perhaps most dramatic are the estimates of infant mortality which range from 40 or 50 deaths per 1000 live births down to 15 and even lower--this in comparison with a reported rate of 150 in Shanghai in 1948.<sup>103</sup>

While a variety of schemes have been proposed to utilize the concepts of auxiliary personnel,<sup>104</sup> a few basic generalizations are possible:

1. Auxiliaries can be trained much more rapidly, and at lower cost than professionals (or, for that matter, paraprofessionals such as nurses): in Guatemala the estimated training cost (total) for a rural health technician (20 months training) is \$1920, while training for a registered nurse (3 years) costs \$4320, and for a physician (7 years) \$19,150.<sup>105</sup>

2. Auxiliaries are also less expensive to employ; in Malaysia auxiliaries cost 75-85% less than the doctor per working day.<sup>106</sup>

3. Auxiliaries provide primary care and simple treatment for which they have practical training, a much more efficient utilization of resources

than employing highly-trained physicians for such work. In fact, the bulk of disease in rural areas does not require specialty or advanced medical care. A problem faced in the rural health-corps stations in Iran is that health-corps physicians are excessively overloaded: "The aides are not allowed to screen patients, but the physicians feel that 80% of the complaints they see do not require a physician but could

4. As auxiliaries are drawn from rural areas for training, the phenomenon of "social distance" between health personnel and patients is substantially reduced. Auxiliaries also are less likely to harbor the expectations and ambitions of the medical graduates, enabling them to accept rural life with equanimity.

5. A primary difficulty in launching auxiliary-based programs has been the opposition from the medical establishment. In many cases auxiliaries have been assigned to remote and isolated areas, but have received virtually no support or further training thereafter. In some countries the licentiate (a category of doctor with a shorter period of training, though more than an auxiliary) used to fill the many vacant posts in government rural services but now is being abolished so that the "quality" of medical care may not be diminished.<sup>108</sup> To avoid posing such a threat to the medical establishment and its professional and economic interests, the rural health technician in Guatemala can, by law, only work in rural areas.<sup>109</sup>

In terms of distributional effects, the physician-dominated, urban oriented health system clearly is skewed toward middle and upper income groups and has the overall effect of widening differentials in health care, and in turn, real income. Auxiliary based systems, particularly those utilizing local personnel responsible to the community, have the opposite effect by providing services inherently biased toward the poor, who being more in need, will benefit most from them.

#### Country Programs

Although brief generalizations can be dangerous and misleading (and run the risk of being quickly outdated), there is some value in examining the directions actually being pursued in a range of low income countries. First Asia: Where the private sector is particularly strong, as in Thailand, Indonesia and even Iran, the public health sector is generally short of resources and dependent on physicians who engage in part-time practice to supplement their incomes. It is no surprise, then, that in such circumstances public sector physicians are geographically distributed in a fashion similar to the private sector. In Turkey, for example, "the symmetry of the geographical distribution of physicians in both sectors is contrary to the general impression that the public

physicians differently from the spontaneous market control of the private sector."<sup>110</sup> In both sectors only about 16% were found to practice in towns and rural areas.

Ceylon, on the other hand, is an example of a low-income country with a reasonably effective public sector: The private sector is relatively small, inexpensive to the user and supportive of the more equitable distribution of resources of the public health sector. Oscar Gish observes that in terms of equity Ceylon has one of the best health care systems in all of Asia:

"To begin with, the rural areas of Ceylon are more accessible, better developed and more attractive than those of India and Pakistan. In addition, the fact of a relatively small private health sector coupled with reasonable public sector expenditures had made it possible for government employment to become sufficiently attractive, particularly in the rural areas, so as to be more appealing to the young medical graduates than the vagaries of private practice." 111

In black Africa, the recent colonial experience and the overall shortage of modern health personnel have produced a somewhat different picture. Here the private sector is less developed (although highly skewed) and the public sector seems, at least, in some countries, better able to pursue independent priorities. Still native-born doctors are predominantly found in the large cities while a large number of foreign nationals provide health care in the rural areas. And an extensive proportion of the population may have no access to health care at all. A diversity of government policies emerges: in Tunisia not only are new medical graduates required to spend two years in rural service, but private medical practitioners have been prohibited from settling in the capital;<sup>112</sup> in Ethiopia most of the rural medical care which does exist is supplied by auxiliaries, as in the commonwealth countries of East Africa (especially Kenya);<sup>113</sup> in Ghana the government

has attempted to provide all health services without substantial charge;<sup>114</sup> in Tanzania the socialist-oriented government has placed high priority on the rapid expansion of rural health services through health center construction and the training of all types of health auxiliaries.<sup>115</sup> Thus while great disparities exist between urban and rural populations, several governments have been making constructive efforts to alleviate them.

Latin America, finally, is in a peculiar position: although the public sector exerts significant influence in many countries, this influence is fragmented into separate delivery systems which to some extent are replicative. Ministries of health generally lack substantial authority over medical care, and the health services often are poorly coordinated (reform measures have been taken to address this problem in Colombia and Argentina). The more influential interest groups, i.e. the military and the white collar employees are able to corner the best resources: in Colombia, for example, "the expenditures for social security health coverage (some 30-40 percent of government health spending) primarily benefit employees of government and modern private enterprises, who represent only about 10 percent of the total population."<sup>116</sup> As elsewhere, the private sector is highly skewed in distribution, being concentrated in urban areas, and largely catering to upper income groups.

An exception to this pattern is Cuba. Following the socialist revolution in 1959, a strong, centrally administered national health service developed, which put much emphasis on the rural health system.<sup>117</sup> Of the more than 200 rural health centers constructed, a majority were in areas not previously covered by the health system. Moreover not only was a program of rural service for new medical graduates initiated, but virtually all public sector physicians (the vast majority) were required to devote some time to the health centers and rural areas in the course of each year.

Equally important, the health services have had the cooperation of mass organizations in public health campaigns. Although urban-rural differentials continue to exist, they are minor compared to those of other Latin American countries, or to Cuba prior to the change of government.

#### Other Health Measures

While the above overview has been largely confined to health care services per se, it is important to recall that other measures, while commanding but a small and perhaps erratic portion of the health budget, can have significant distributive consequences.

In particular, programs aimed at the control or eradication of vector-mediated or infectious diseases have contributed substantially to the reduction of mortality rates. The discovery of particular weapons against disease -- first the vaccines, then specific prophylactic drugs, and more recently the residual insecticides -- have enabled nationwide efforts which have been universal in target. Unlike health care services, which can be manipulated to benefit the upper income and urban groups, the mass disease-prevention efforts promote the welfare of rural and low income strata as well -- although, of course, coverage may extend to the more accessible and more influential first. The antimalarial programs in India, for example, have been viewed as a means toward greater equity, given their broad benefit incidence:

"Especially in poor countries with severe resource constraints such as India, preventive public health measures, such as antimalarial programs, may be one of the cheapest and quickest ways of generating widespread improvement in human well-being, and especially of extending significant tangible benefits to the poorest third or half of the population." 118

A further beneficial spin-off has been the encouragement of local health service development by these programs: in Latin America early campaigns against yellow fever, tuberculosis, and dengue stimulated the develop-

ment of rural services.<sup>119</sup>

As environmental conditions are closely associated with morbidity and mortality, environmental sanitation and improved water supply may be as vital to health improvement as access to health care. Yet rural areas lag seriously behind the cities: in a Colombian survey, although virtually all urban houses and apartments had inside toilets and water supply, over half of all dwellings in rural areas had no water supply, and three-fourths no toilets (inside or outside).<sup>120</sup>

Health education is a third area in which benefits could be extended to low income groups: instruction in hygiene and sanitation might be particularly valuable in child rearing and in combination with the provision of potable water, for example. Yet given the marginal environmental conditions in which the poor live, it is not likely that health education alone could bring about marked changes in morbidity or mortality incidence. Like nutrition education, health education is most appropriate where the family has adequate resource command to be able to implement the messages received. Mass media health education programs suffer from the same limitation.

Finally, nutritional improvement is crucial to infant and young child health and their ability to cope with disease. Yet, as discussed earlier, nutrition programs to date usually have bypassed those most in need.

#### SOME CONCLUDING COMMENTS

Nutrition traditionally has been subsumed under the heading of health, and nutrition programs relegated to doctors and clinical nutritionists. Yet with the advent of nutrition planning, this fledgling policy field has gained a respectability of its own, and today has the audacity to analyze and criticize the health sector from which it emerged.

In both the nutrition and health fields, more careful thought and study must be given to the redistributive potentialities and shortcomings of programs. All too often it has been assumed that additional outlays for health and nutrition reflect governmental concern for those most in need -- the lowest income groups. Yet in countries where there are major disparities in economic and political power, there is little assurance that benefits will accrue to the poor.

At the same time, in countries characterized by such political and economic disparities, and where these are taken as given, it probably is unrealistic to expect acceptance of a health system actually skewed toward the poor. Health innovators should be glad to settle for an even distribution of services, which, in terms of redistribution, would be victory indeed.

The problems encountered in attempting to increase benefits to the lowest income and rural groups differ substantially in the two

areas of nutrition and health. In the health sector, where maldistribution of facilities and personnel seems to be the overriding constraint, considerable opposition can be expected from medical professionals -- who are largely drawn from and represent the interests of the upper income, urban elite -- to major attempts at reallocation of resources. The example of Cuba is instructive in this regard. Prior to the revolution in 1959, the public health sector was weak and poorly coordinated, although the quality (by professional standards) of the Havana-based private practitioners was high. With the change of government, however, a strong national health service was created with broader responsibility to the population as a whole; private practice was discouraged and facility construction and expenditure was oriented toward rural areas. In the course of five years, nearly half of the medical doctors emigrated to the United States. (They were quickly replaced, however, and the total number of physicians increased shortly thereafter). 121

Nutrition programs are at an advantage, in this regard, with less potent vested interest groups to tackle. Nonetheless, the political orientation and power base of the government may limit the extent to which nutrition programs aimed at the poor are acceptable. After all, with nutrition problems concentrated among the poor, nutrition programs clearly are a form of income redistribution, sometimes well camouflaged, sometimes not. The primary need, again, is to

evaluate in more detail the extent to which programs do reach the poorest, and to devise delivery mechanisms which have a greater redistributive impact. As a corollary to this, nutrition programs should be integrated with income generating efforts for the lowest income groups; unless the family resource constraint is addressed, the benefits of nutrition programs to the poor may be minimal.

The identification and development of health and nutrition delivery systems which do reach the poor cannot be considered a substitute for more basic changes in patterns of economic growth. Instead, the injection of health and nutrition considerations into development planning should help refocus such planning on the problems of equity, and stimulate the development of patterns of growth which include as active participants those who, in the past, have been largely forgotten.

TABLE 1: PHYSICIAN DISTRIBUTION RELATIVE TO POPULATION (1964)

	<u>Capital City</u>		<u>Rest of Country</u>	
	% of doctors	% of population	% of doctors	% of population
Jamaica	70	26	30	74
Guatemala	82	15	18	85
Senegal	63	15	37	85
Thailand	60	8	40	92
Kenya	54	5	46	95

Source: N.R.E. Fendall, "Medical Care in the Developing Nations" in John Fry and W.A.J. Farndale, International Medical Care (Wallingford, Pa.: Washington Square East, 1972), Table 7.3, p. 208.

TABLE 2: HOSPITAL BEDS IN MEDICAL ESTABLISHMENTS WITH BEDS

Figures in Beds per 10,000 Total Population

	<u>All types</u>	<u>General Hospitals</u>	<u>Local or Rural Hospitals</u>	<u>Medical and Maternity Centers</u>
Chad	12.1	4.1	2.2	2.3
Dahomey	9.5	3.9	0.8	4.5
Egypt	17.6	8.3	2.5	0.1
Ghana	10.4*	3.0	5.8*	0.3
Nigeria	5.2*	3.7*	0.1	0.5*
Senegal	13.5	7.4	2.0	4.1
Tunisia	24.7	15.0	4.3	0.2
Uganda	18.6*	11.7*	X	5.8*
Argentina	55.8*	38.3*	X	2.2*
Cuba	50.0	19.2	1.2	7.8
El Salvador	21.0*	11.9*	1.0*	1.8
Mexico (1966)	19.5*	15.1*	X	0.6*
Panama	32.5*	22.2*	X	0.9
Peru (1968)	23.9*	18.5*	1.2*	0.3*
Venezuela	31.7*	16.5*	1.5*	1.8
Hong Kong	38.9*	27.1*	0.0	2.3*
Indonesia	6.8*	5.1*	0.6*	X
Iran	12.9*	6.1*	0.2*	2.3*
Pakistan	6.0*	4.3*	0.1*	0.6*
Thailand	10.3*	2.0*	4.5*	0.7
Turkey	20.2*	11.8*	X	1.1

\* indicates total number in country; otherwise figures are for government establishments

X = not known

Source: World Health Organization, World Health Statistics 1969 (Geneva: WHO, 1973).

TABLE 3: POPULATION PER HEALTH PERSONNEL

Figures represent population per one member of these professional categories

	<u>Per Physician</u>	<u>Per Nursing and Midwifery Personnel</u>	<u>Per Medical Assistant</u>
Algeria	7,680	2460	134,850
Ethiopia	71,800	X	164,040
Ghana	15,200 R	1050 R	46,000
Kenya	12,140	3140	12,120
Senegal	15,120	2200	39,790
Tanzania (Tanganyika)	24,680	3410	53,450
Tunisia	5,780	760 G	X
Uganda	12,920	1370	22,720
Zambia	13,580	X	4,450
Brazil	1,950	3080 H	X
Chile	2,440 G	4330 G	X
Guatemala	4,860	5220	X
Haiti	13,210	7340	X
Peru	1,920	2580	X
Venezuela	1,100	460	28,120
Bangladesh	7,600 R	43,160 R	X
Ceylon	3,690	1460	9,560 G
India	5,240	5650	X
Indonesia (1967)	27,560	5740 G	X
Iran	3,330	2850	293,580
Pakistan	4,020	7400 G	X
Thailand	8,410	2360	330,860
Turkey	2,260	1240	X

G= Personnel in government services

H= Hospital personnel

R= Number on register. Not all working in the country

X= Not Known

Source: World Health Organization, World Health Statistics 1969 (Geneva: WHO, 1973).

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