Medical Problems of the Developing Countries

How can large numbers of ill, malnourished patients be treated with limited staff, drugs, and finances?

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Although developing countries vary in geographic size, population pressures, and natural resources, a number of generalizations can be applied to them. Their economies are based on subsistence agriculture, and average incomes are low. In almost all fields there is a lack of trained technicians. Despite the governmental premium on education and massive education programs, the literacy rates are very low, a fact related to the lack of trained teachers.

By Western standards the populations are young, with almost half the people less than 15 years of age, and up to one quarter below school age (*1*). Approximately 90 percent of the population of developing countries is rural, with a definite trend toward urbanization (*2*). Vital statistics are either unreliable or nonexistent, but childhood mortality rate is known to be extremely high. Infant mortality is 3 to 10 times that of developed countries, the mortality among pre-school children is as much as 30 to 50 times as great, and about 40 percent of the total mortality occurs in children under the age of 5 years. Approximately half of the children born never reach their fifth birthdays (*1*) (see Table 1).

Fertility rates are so high that, in spite of large losses among children and the resultant shortened life expectancy, there is a population increase which is estimated to approach 3 percent annually (*3*). The population explosion causes land hunger, which is directly related to physical hunger. Thus medical prevention of death from disease may merely add to the numbers dying from starvation.

Population has often been equated with power, and curtailing the growth of population is synonymous to some minds with inhibiting the growth of power. Birth control programs may meet resistance, as government agencies reject certain plans or render them ineffectual through indifference.

As a result of mass migrations, the annual growth of the population in cities and towns is even greater than the growth of the population in general. Associated with the drift to the towns is a rapid dissolution of rural familial and social structure which is inaugurating major changes away from the traditional mode of living. Juvenile delinquency, alcoholism, and promiscuity will predictably increase along with those diseases of overcrowding, poliomyelitis, typhoid fever, and tuberculosis.

Education is being sought by the young as a means by which to escape the closed agricultural life of their ancestors, and it is ironic, if understandable, that at a time when food production is becoming more critical the departments of agriculture in the universities of these countries have very few applicants. The consequences of limitations in educational progress are obvious. Although the governments are concerned with education, the shortage of trained teachers and adequate buildings and the ever-present shortage of funds must limit the eventual supply of professional people, technicians, teachers, and administrators.

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Medical Services Are Deficient

In the presence of population pressure, high childhood mortality, limited educational facilities, and the failure of rapid development of agriculture, there are gross deficiencies in quantity of medical services (see Tables 2 and 3). Governmental expenditures in the field of health are low in relation to the need (*4*). The doctor-patient ratio ranges from 1 to 20,000 to 1 to 100,000, compared to a ratio of 1 to 1000 in many developed countries (*5*). For various reasons most of the available doctors are found working in larger towns, and so the situation in rural areas is even more acute than these figures indicate.

There are correspondingly few trained nurses, midwives, and other medical personnel, in addition to shortages of hospital beds, clinics, and health centers (*6*). With a limited national budget, there are many urgent problems, and very little money is available for solving those related to health. Medical expenditures may range from one-twentieth to one-tenth of the amounts designated in developed countries for each person annually (*5, 7*).

Characteristic Disease Pattern

To understand the medical problems of the developing countries, it is important to appreciate the background of the complex interrelationships among health, economics, political considerations, and sociological parameters. Despite many variable factors, the disease pattern is surprisingly similar in all developing countries. There are certain common childhood diseases, most if not all of which are preventable. Leading the list invariably are malnutrition, diarrhea, and respiratory illnesses, often interrelated. The pediatric list continues with malaria, tuberculosis, intestinal parasites (especially hookworm and roundworm infections), and the so-called childhood infectious diseases (particularly measles and whooping cough), followed by accidents such as kerosene poisoning and burns.

Among adults are found various types of anemia and deficiency diseases, tuberculosis and leprosy, such parasitic diseases as malaria, schistosomiasis, filariasis, and others caused by locally prevalent parasites, trachoma, venereal diseases, mental illnesses, dys-

Table 1. Life expectancies, at birth, for people (both sexes) in some developing countries and the United States. Adapted from (*16*).

Country	Life expectancy (years)
Mali	20.3
Guinea—rural areas	30.5
urban areas	35.8
Central African Republic	32.3
Senegal	36.9
Rhodesia and Nyasaland	48.0
Mozambique	45.0
Zanzibar	42.8
U.S.A.	Over 70

entery, and cholera. Also present are all the other medical conditions which are found throughout the rest of the world. There are, of course, a number of unusual diseases peculiar to one region or another, but these usually do not constitute significant problems.

The major difference in the pattern of disease is that rarely is a single condition present alone. The salient feature is the superimposition of a particular disease on a malnourished, anemic, and parasite-burdened individual. The underlying problems will weaken the person, undermine his resistance, create a far more serious medical problem of management, and most likely increase the complications and militate against survival. As can be imagined, chronic diseases of elderly persons, the so-called degenerative diseases, are not a significant public health problem.

A limited health budget, few hospital beds, and shortages of medical and technical staff, added to the weakened and disease-ridden population, create major medical problems for administrator and clinician. The criterion for hospital admission is often the basic consideration of survival. Hospital treatments are aimed not necessarily at cure, but at lightening the burden or tipping the balance in favor of the patient so that he can be discharged from the hospital and free the bed for the next admission. In many instances this approaches what could be classified as first aid.

Most patients admitted to modern hospitals in developing countries have already been seen and treated by a local practitioner or healer. Despite this tendency, modern facilities have gained popularity and are constantly hard-pressed to keep up with the demands for service.

Many of the medical conditions described are preventable. This is a valid statement in theory, but in actuality prevention is hampered by many factors. Far less costly than therapy in terms of personnel and money, prevention remains difficult in places where there is inadequate education, general illiteracy, and ignorance. Health is affected by various superstitions, taboos, and erroneous beliefs about the causes and cures of illnesses. Fatalistic acceptance of death is very common and presents a major obstacle.

It is extremely important for workers in the health fields to attempt to understand indigenous beliefs and practices concerning health and disease. The field knowledge of anthropologists and sociologists can and should be of great importance in the solution of what appear to be overwhelming medical problems. Arensberg and Niehoff recently commented that, although it might appear that a superior technique for growing crops or for healing the sick or for educating the young would automatically be accepted by those lacking these techniques, any technician who has worked in the developing countries can tell of superior techniques that failed to be accepted only because the habits and customs of the local people were not taken into consideration by those proposing them (*8*).

Some local customs are excellent and necessary; these should be encouraged and protected. Other traditions are harmful and often can be dislodged only by circuitous means and with the combined efforts of doctors, nurses, health educators, social scientists, and politicians (*9*). Typical of the harmful customs are those which impose dietary restrictions, such as reverence for cows in India, refusal to eat fish or chicken or eggs in certain regions, and taboos limiting the use of foods during pregnancy and lactation. The health worker must use great skill and ingenuity to counteract these harmful customs.

The general conditions of health in developing countries today are not dissimilar from conditions existing in Europe and the United States 50 or 100 years ago. Chaudhuri observed that "masses of children in India, especially in the slums of large cities, know nothing of life but the pain and lassitude of hunger. Children do not die only of hunger, but also of lack of care and unhygienic conditions. Many children have no home or shelter at all. Many live in the streets of the town and sleep on the pavement" (*10*).

Table 2. Number of patients per doctor, and health expenditure per capita, in various countries. Data from (*17*).

Country	Ratio	Health expenditure ($)
Soviet Union	529	
United States	710	30
Argentina	770	
Japan	916	
England and Wales	1,060	39
Brazil	2,420	0.65
Dominican Republic	3,000	
Turkey	3,500	
Ceylon	4,700	2.50
India	5,040	0.46
Madagascar	11,100	1.95
North Borneo	12,279	2.80
New Guinea	13,000	
Uganda	13,100	1.40
Congo (Brazzaville)	14,000	5.50
Angola	14,820	1.40
Tanzania	18,000	0.56
Basutoland	21,000	1.20
Ghana	21,000	
Sierra Leone	21,200	1.50
Colombia	23,000	
Indonesia	31,000	
Afghanistan	33,000	
Nigeria	33,000	0.70
Mauretania	36,000	
Central African Republic	39,000	
Togo	46,875	
Chad	61,000	0.95
Nepal	72,000	0.42

Table 3. The number of hospital beds per 1000 population in various countries (1957–60). Data from (*17*).

Country	Beds per 1000
Canada	10.6
United States	9.1
Gabon	6.6
Colombia	4.9
Congo (Brazzaville)	4.5
Jamaica	4.2
Uruguay	3.9
South Africa	3.6
Chile	3.5
Ceylon	3.1
Bechuanaland	2.9
Ecuador	2.2
Angola	2.1
El Salvador	2.0
Togo	1.8
Ruanda	1.53
Central African Republic	1.5
Basutoland	1.4
Uganda	1.4
Tanzania	1.36
Kenya	1.3
Indonesia	0.84
Thailand	0.84
Mozambique	0.8
Ghana	0.79
Burma	0.58
Nigeria	0.47
Niger	0.43
India	0.24

Health education in India. Not long ago more than half the children missed school because of malaria. [UNICEF photo]

Calcutta water, supplying over 5 million people, is in short supply. Every possible source is in use, and hydrants are often connected with untreated river water. High incidence of water-borne diseases, including cholera, typhoid fever in epidemics, intestinal infections, and childhood diarrhea, results. [WHO photo by Paul Almasy]

General living conditions and diet were described by a Joint UNICEF-WHO Committee on Health Policy: "Probably three-fourths of the World's population drink unsafe water, dispose of human excreta recklessly, prepare milk and food dangerously, are constantly exposed to insect and rodent enemies, and live in unfit dwellings" (*11*). These factors, whose adequacy is often taken completely for granted in advanced societies, are responsible for many common medical problems which could be controlled simply by improved environment.

Malnutrition a Principal Problem

Undernutrition and malnutrition constitute perhaps the most serious deterrents to progress in the developing nations. Nutritional defects can limit the physical and mental development of individuals, which in turn will limit their contribution to social and economic progress (*12*). Malnutrition is the major public health problem in the world today. In areas where protein deficiency is the most significant nutritional disorder, there is often, curiously, an abundance of protein. Those people who are malnourished are not aware that they lack protein, and unfortunately protein foods may be available only in a form which is either unacceptable to their customary food pattern or too dear for their normal household budgets.

Since malnutrition retards economic development and interferes with educational progress, it is not only a medical but also a political and social problem. Half the world's population suffers from hunger, defined as insufficient quantity of food, or from malnutrition, which is inadequate quality of diet, or from both. Recent figures indicate that the population increase is outstripping the food supply so that available food per capita is decreasing despite improvements in food production. It must be appreciated that the natural balance of selection which at present functions in many countries is gradually being interfered with by developing preventive medicine and curative services which add to the population explosion.

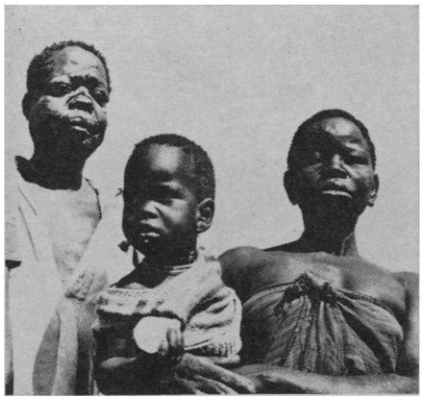
It is apparent that the answer to many of these problems must involve long-range planning in fields beyond that of the traditional healer. Education of farmers, mechanization of agriculture, use of fertilizers, and improvement of crops and animal varieties must be combined with intelligent programs of birth control and family planning. If malnutrition does not directly or indirectly cause death in the developing countries, it may cause physical and mental stunting and make individuals listless and incapable of vigorous activity.

Birth rates tend to fall whenever standards of living rise. Impairment of social and economic growth is related to nutritional problems, and with the passage of time one can add to the other in a vicious circle. The solution, therefore, must be broadly based, with the knowledge that nutrition may very well be the key factor.

Those most susceptible to protein deficiency are infants, pre-school children, and lactating and pregnant women. The amount of protein necessary for growth and development of body tissues at these critical periods is very great. Emphasis must be placed on the cultural patterns which determine what foods are available, how they are prepared, and who may eat them.

Protein quality is assayed on a scale of biological value, the perfect protein food being given a value of 100. Milk, eggs, fish, and beef have very high values. Although cereal grain, oil seeds, and legumes have somewhat lower values, these can be upgraded by means of processing and proper mixing with other foods.

In many countries high-value proteins are generally not available or too costly for people with low incomes. The usual diet is composed of cereal grains or starchy foods, which may provide enough calories but which contain less than 15 percent protein. It would require an impossibly large intake of these foods to fulfill daily requirements. It is urgent that the poor, uneducated person be assisted in appreciating the fact that he and his children are malnourished and be given information on the utilization of



A healthy child of parents with leprosy will be put on prophylactic therapy with dapsone and given a B.C.G. (bacillus Calmette-Guérin) vaccination against tuberculosis. There are 2½ million cases of leprosy in Africa, and about 1 million patients are under treatment. [UNICEF photo by George Halton]

his existing food resources. Local governments must similarly first recognize that this constitutes a major problem before they seek a solution.

Overseas Financial Support Is Not the Solution

Developing countries of Africa, Asia, and Latin America at present lack the technical and financial resources to achieve the level of social and economic advancement they desire. The advanced countries must recognize both humanitarian and international obligations toward the less-favored countries. These obligations are not simply a matter of introducing financial aid from abroad.

The management of medical problems involves a consideration of nature's delicate balance and an understanding of the social-economic-political structures of nations embued with the desire to advance, as well as an awareness of the problems of altering fundamental traditional structures. The ultimate answer lies in the field of education, which will be developed with the passage of time.

The world is divided into countries that are rich and countries that are poor, and the medical problems in each of these categories are distinctly different. The rich countries have more than enough doctors, nurses, and technicians; there are drugs, hospital beds, food, and equipment in abundance, reliable sources of water and milk, good sanitation, high standards of general education, adequate transportation and communication, and a reasonable per-capita income to insure a high standard of living. These factors represent a historical development of gradually improved socio-economic conditions, in the course of which medical problems were systematically approached and solved. While medical facilities were being improved in the developed countries and adequate personnel trained, environmental improvements independently alleviated many of the public health problems.

In the countries of Africa, Asia, and Latin America the present situation can be described in completely contrasting terms. The discrepancy between the two worlds is only in part a matter of finances. Money alone will not completely solve these complex problems. In the developing countries an improvement is needed in the general attitude toward health and disease, which ultimately is a factor of education. Long-standing customs and superstition govern much of what is currently thought and practiced in health matters. As standards of living improve, the bases for many medical problems will be eradicated. As the numbers of trained medical workers increase and the general level of education improves, the problems here described will be altered.

Is There a Solution?

The basic problems of medicine can be approached with simple, effective, scientifically guided modern methods, predominantly preventive, applied in spite of adverse circumstances. At the moment the health problems facing a surprisingly small number of workers with drastically limited facilities are staggering. There are simply too many extremely ill patients to be managed under conditions far removed from the ideal. There is no prospect of an early solution. The application of available modern methods would save many lives, especially in early infancy and childhood. But, unless the trend is modified by careful planning, birth rates will continue to be high, and total numbers in the population will consume available food supplies and add to the already crowded schools and hospitals.

Increasing urbanization will create more unemployment and extend the unhealthy conditions in and around the towns and cities. Until mechanization is introduced in force, agricultural production cannot be developed, and food shortages will persist or become worse. It can be predicted that the numbers of trained teachers and schools will continue to be insufficient to cope with the population's growing concern with education, and there will be an increase in the number of discontented people. Training facilities are inadequate at all levels of medical education as well.

A man collecting water from an unprotected stream, where stagnant water breeds a harvest of many bacteria. [Photo by R. Wellington, Medical Illustration Department, Mulago]

There is a need for trained individuals in every field—teachers, lawyers, agriculturalists, administrators, and so forth. Within governments various ministries are competing for limited funds, and within educational structures various departments are competing for the few well-qualified people available. Time will provide many of the solutions, but the interim growth pains and developmental processes will be plagued by difficulties.

Paradoxically, the highly developed nations are ill prepared to provide the developing countries with needed assistance in health matters (*13*). Medical graduates from advanced countries are often poorly qualified to assist in the development of health services in these other countries because, in their training, curative medicine has been stressed to the neglect of preventive and public health medicine. Ultimately, all mankind will benefit from modern medical advances, but present-day research is distant from such urgent considerations as the prevention of severe childhood malnutrition or the control of endemic bilharzia.

Conclusions and Summary

There can be no immediate solution to the medical problems of the developing countries. Priorities are demanded, and it must be acknowledged that in allocation of medical priorities certain compromises are required. It can be hoped that the least detrimental compromises will be selected. Careful planning of health services and also of training programs for various medical personnel must not rely on what exists in developed countries, because those facilities and programs may be completely inappropriate to other situations.

At the same time as inroads are made into the preventable conditions which now claim thousands of young lives, programs of birth control and improvement of agricultural methods must be emphasized. The reduced morbidity and mortality which results from immunization against childhood infectious diseases, smallpox, and tuberculosis must be borne in mind in overall planning for schools and general health services. Inexpensive and practical programs that could be managed by medical personnel who are not highly trained should be considered.

As the benefits of technical development gradually reach the urbanizing population living under poor social and hygienic conditions, changes in the disease picture must be anticipated. Those involved with planning and training must understand various cultural influences so that the transition period can be made as painless as possible. Certain seemingly attractive Western procedures should be guarded against if they are not practical. For instance, a common tendency is to build large modern hospitals throughout the land with disregard for the fact that these hospitals cannot possibly be staffed, equipped, or maintained because of shortages of trained people and available funds (*14*). This has been called an "edifice complex" and is unfortunately found in many developing regions, stimulated often by ill-considered advice from overseas experts.

At the same time as medical services are being improved, it is extremely important to document the improvements by means of carefully recorded statistics. Guidance in necessary methods for documentation should be sought early in the development of medical care (*15*). Obviously it is vital to determine what and where the major medical problems are so that programs will be designed to attack them. Once the problems are sorted out, available resources can be allocated and preventive measures and health education can be aimed at specific aspects of public health.

Many general statements have been made to describe the medical problems in the developing countries of the world. There is a need to particularize the problems and approach the specific manifestations of disease with knowledge of local conditions and resources. Accepted textbook solutions no longer apply in the field, and the ultimate solution may be along lines which are completely unique and nontraditional. To break the usual rules may be the only practical means to solve the problem at hand, and modified common sense must often replace modern technology. The practical variations on the general theme described here make medical work in developing countries interesting, exciting, and rewarding.

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