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KEY PROBLEMS IMPEDING MODERNIZATION OF DEVELOPING COUNTRIES

THE HEALTH ISSUES

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FOREWORD

The well-being of people is central to the objectives of U.S. foreign assistance. Well-being depends, of course, upon a number of important and closely linked factors. Jobs, education, security, and a sense of participation, are all vitally important, but none have much significance without basic good health. Today, in the developing countries, progress is being hampered by a failure of many people to understand how to adapt to the world of disease and insecurity in which they live. Health programs, based primarily on transference of Western curative medicine, have not done much to reduce this basic problem. A new focus is needed–where health efforts can do the most for the peoples of the poor countries–covering such fields as family planning, nutrition, preventive medicine, and environmental sanitation.

This paper on health issues analyzes the relationship between health and modernization in the developing world and identifies three areas for priority attention by the Technical Assistance Bureau. The key problem areas selected are among the most critical for immediate action. They are aimed at improving the efficiency of the developing countries' own substantial expenditures in the health area, getting more and better health, nutrition, and family planning services to people in rural areas, and reducing the staggering losses in food energy resulting from fever and enteric diseases.

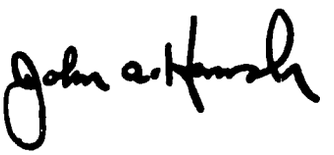

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TABLE OF CONTENTS

Page

I. AN APPROACH TO PROBLEM IDENTIFICATION 1

II. A COMMON DEFINITION OF MODERNIZATION 2

III. A DEFINITION OF DISEASE 11

IV. THE DEFINITION OF HEALTH 19

V. KEY CATEGORIES OF HEALTH PROBLEMS WHICH IMPEDE DEVELOPMENT 23

A. THE BIOLOGICAL BARRIERS 25

1. The High Burden of Disease 25

2. Rapid Population Growth 33

3. Malnutrition 37

4. Environmental Pollution 38

B. THE ADMINISTRATIVE BARRIERS 39

1. The Problem of Instruments 39

2. The Problem of Manpower 42

C. SOCIAL AND CULTURAL BARRIERS 43

D. THE RESEARCH GAP 45

VI. A FOCUS FOR ACTION 46

1. Absence of Effective Health Delivery Systems 46

2. Limited Capability for Key Problem Perception and Planning 46

3. Inefficient Utilization of Food Energy 46

VII. SUMMARY 48

TABLE OF CONTENTS (CONT'D)

Page

ILLUSTRATIONS

Figure I: Broad Patterns of Demographic Change in India and Ceylon and in Northwestern Europe and Japan 14

Figure II: The Beginning of Demographic Change in Ceylon, 1900 - 1959 15

Figure III: The World's Population Growth 17

Figure IV: Growth of World Population: Geographic Regions With Projections 18

TABLES

Table I: Reported Cases and Deaths from Communicable Diseases in the Three Regions of the Americas, 1965 and 1966 16

Table II: Major Health Problems Identified by World Health Assembly Member Countries and Classified by Numbers of Identifying Countries in Each Geographical Region 24

Table III: Illustrative Magnitudes of Infectious Diseases 25

Table IV: "Cultivated" Land on Each Continent, Compared with Potentially Arable Land 31

REFERENCES: 53

KEY PROBLEMS IMPEDING MODERNIZATION

OF DEVELOPING COUNTRIES:

THE HEALTH ISSUES

Through a series of key problem analyses on each of the principal sectors of development, the Technical Assistance Bureau is seeking to mobilize professional attention in-depth on the most important problems impeding the achievement of modernization goals of developing countries. These analyses are intended primarily to identify key problem areas for special attention within the program of the Technical Assistance Bureau, although it is hoped that the Agency as a whole will benefit from a study of jointly identified problem areas.

I. AN APPROACH TO PROBLEM IDENTIFICATION

As a first step in key problem identification, reference will be made to a set of overall modernization or development goals as viewed by assisted countries. Looking beyond sectoral program goals, the concept of modernization requires definition in order to serve as a common reference point to which all development efforts relate. The identification of problems, and the relative importance of problems, within various development sectors or between sectors, would be difficult to assess without rational grounds for comparability.

It is only practical to recognize that modernization, both in concept and program, is subject to wide diversity of interpretation by developed and developing nations, and between the elements of donor agencies. George Woods has viewed this diversity with the "opinion that the developed countries would materially benefit their own interests if they could achieve a unified and consistent perspective of the problems of growth in the less developed countries and of the importance of that growth to their own well-being."[1]

In spite of the limitations and difficulty of defining modernization, let alone achieve consensus on goals and perspectives, it is necessary to state our perception as a logical basis for problem analysis. For this purpose, it is useful to summarize some of the principal modernization values and goals of the developing countries themselves, irrespective of external assistance input, in order to see the relevance of indigenous health problems to the process of development.

II. A COMMON DEFINITION OF MODERNIZATION

One approach to a definition of modernization objectives of developing countries is to summarize official statements of goals as stated in national development plans or Agency field program submissions. As a practical procedure, A.I.D. programs must be formulated around bilateral arrangements which seek to match A.I.D. resources with mutually agreed development objectives.

Yet, national development plans and donor-agency programs frequently state goals which by themselves constitute intermediate points towards unstated or very broadly stated modernization objectives. The search for problems that impede these intermediate goals is a necessary, important, and valid activity. Having identified these problems, however, the questions remain as to whether the appropriate long-range development goals have been addressed and whether the problems of developing countries have been analyzed within some relatively uniform perspective of the modernization process.

Although the last twenty years have yielded a large body of experience and study on this process by scholars, assisting institutions, and governments themselves, the very specialization of scholarship in recent years has tended to yield views of modernization which are placed in a dominantly political or economic framework rather than in an ecological perspective which includes all variables. For example, Paul Samuelson[2] sees the obverse of development in these terms: "An underdeveloped nation is simply one with real per capita income that is low relative to present per capita incomes of wealthy nations such as Canada, the United States, Great Britain, and Western Europe. Usually an underdeveloped nation is regarded as being capable of substantial improvement in its income level." Does this represent the primary intent of modernization?

In the broader ecological sense, Professors Arnold Toynbee, Crane Brinton and Rene Dubos describe man in the course of history, not only as a producer of wealth or a seeker of power, but as one whose ability to survive and to enjoy survival depends upon the success and the method by which he adapts to his total physical and social environment. Of the 26 civilizations identified in Toynbee's "Study of History"[3], sixteen are dead, and nine of the remaining ten are in dissolution. The cause and process of breakdown are described.

One need not draw on the whole nature and pattern of human experience, as presented by Toynbee, to appreciate that nations have stagnated or failed to grow where modernization, in the modern context of growth and adaptation has been misunderstood, unaccepted, or incompletely formulated.

In his book, "The Shaping of the Modern Mind," Professor Brinton[4] provides a historian's view of the influences and ideas leading to what we now call "the modern world." Primarily a record of the evolution of Western concepts over a period of five centuries, Brinton stresses that arts, letters, religion, science and technology were inseparably combined in the values and life that were to be commonly called "modern."

Turning to the developing world, Myrdal in his classic inquiry into the poverty of nations, "Asian Drama", observes: "The modernization ideals are all, in a sense, alien to the region, since they stem from foreign influences. But they have come to be indigenous in the sense that they have been adopted and shaped by the intellectual elite, who, in turn, have endeavored to diffuse them throughout the population."[5]

Confirmation of Western origins, at least in one sector, is provided by the Indian economists, Jather and Beri, [6] who find no purpose in attempting to record the history of Indian economic thought: "Possibly such a history would make rather uninteresting reading since there is no continuous development of thought to trace—no movement of thought to record—and the ideas held in one century were more or less the ideas held in succeeding centuries, until we reach quite recent times when we have to reckon with Western influences."

Recognizing the practical wisdom, administrative skills and cultural talents that have distinguished many indigenous leaders prior to the introduction of Western thought, it is useful to note that modernization goals and values in developing countries have evolved in a gradual sequence starting with the introduction of Western thought, education, and administration by European powers over a period of approximately 500 years, dating from the late 15th century. This process has been hastened in recent history by 1) the rapid liquidation of colonial power structure after World War II, 2) the desire for national political, economic, and social development following independence, and 3) post-war international tension created by the cold war and its influence on the foreign policy of donor nations.

Myrdal, after intensive study of modernization goals and ideals of developing (principally Asian) countries themselves, provides the following set of values, fully cognizant that such values are mainly the ideology of a politically alert, articulate, and active intellectual minority:

1. Rationality

Public debate on national policy should be founded on rational or "scientific" considerations. The acceptance of rationality is understood as a major break with centuries of deeply ingrained a-rational culture and tradition. Nehru [7] recognized that "Modern technique follows modern thinking. You can't get hold of a modern tool and have an ancient mind. It won't work."

The wide gap between this ideal and its acceptance by a majority of the "common man" constitutes a major obstacle to the receptivity of technical change or modernization in any development sector.

Developing countries themselves are aware, perhaps more than donor nations, that programs which require wide popular participation are dependent upon an understanding of technical rationale. The absence of public understanding has, in fact, placed a major constraint on effectiveness of national investment and external resource transfers.

Public understanding of scientific reasoning, beyond the limits of indigenous "common sense", is not likely to yield rapidly to traditional approaches such as public information or improved communication. Notwithstanding the dramatic

communication impact of the transistor radio which widely disseminates news of public events, national and international communication at this level is no match for the formidable barrier of illiteracy and custom which preclude ready acceptance of scientific reasoning. Indeed, there may be no widespread acceptance of Western thought or technology until several generations pass through greatly expanded educational programs. The problem applies equally to Western medical and health technology which, contrary to post-World War II expectations, has not yet been applied, except for relatively few mass disease control campaigns, to more than 10 percent of the total population of the developing world.

2. Development and Planning for Development

This value follows the quest for rationality by an endeavor to identify "a rationally coordinated system of policy measures that can bring about development."[8]

From the viewpoint of developing countries themselves, directly faced with a full-range problem, national development characteristically encompasses reform in social, political and economic spheres. Myrdal stresses that "It is now taken for granted that many, or indeed all, of those undesirable conditions that together constitute underdevelopment do not exist independently of each other, but are interdependent."[9]

Pakistan's Second Five-Year Plan (1960-1965) states, "The interrelationship between many aspects of the development of human resources can be readily demonstrated. When vast numbers of the population are undernourished, ill-clad, illiterate, sick, under-employed and poor, the energies of the people are necessarily at a low ebb. One deficiency leads to another in an endless cycle of contagion. Economic and human aspects of the Plan programs are also interdependent. Productivity is affected by conditions of health, education, and welfare among the workers and their families. The success of health measures, in turn, is partly contingent upon improvements in housing and public sanitation and in levels of literacy and understanding among the people.

The Indian Second Five-Year Plan (1956) repeats the awareness of facing all the key variables by noting: "Development . . . . . touches all aspects of community life and has to be viewed comprehensively. Economic planning thus extends itself into extra-economic spheres, educational, social and cultural."

If the requirement for a comprehensive view of development is mandatory for governments of the developing world, it would seem relevant for assisting organizations in the developed world to seek a comprehensive understanding of all key variables. That this is not always the case among donor agencies is evident from the frequent pre-selection of programs for analysis and emphasis.

The practical issue for rational planners, both in donor and recipient nations, is how to arrive at a formulation of a comprehensive plan, avoiding the pressure to pre-judge priorities. Brian Abel-Smith,[10] Professor of Social, Administrative, and Political Science at the London School of Economics, views planning and priorities as choices "between informed decision-taking and uninformed decision-taking. The economist can only pose the choices."

3. Rise in Productivity

Higher per capita output within the labor force is a commonly shared goal of development planning. Myrdal notes that accomplishment in this area through improved techniques and increased capital intensity in all branches of production are, in turn, dependent on raised levels of living, improved attitudes and institutions, national consolidation, and, indeed, on the realization of all the other key modernization goals listed here.

Donor agencies, uncertain of the possible impact of health measures on population growth rates, have made relatively little contribution during the past twenty years, except for the yaws, smallpox, and malaria campaigns, to help governments improve the productivity of the labor force through measures which reduce sickness on a comprehensive nation-wide scale. As a coordinating technical organization, the World Health Organization (WHO) has provided major technical advisory assistance. The direct contributions of WHO, being limited primarily to advisory assistance, have not been adequately matched by the investment of external resources which are necessary to catalyze significant comprehensive improvements in productivity.

4. Rise of Levels of Living

The common desire to escape extremely low levels of living and well-being represents a major source of social discontent for nations which, prior to colonial times, traditionally accepted their condition as unchangeable.

Myrdal provides the following list of physical indicators to describe the most pertinent aspects of levels of living:

(a) food and nutrition
(b) clothing
(c) housing, including sanitation
(d) health facilities
(e) educational facilities
(f) information media
(g) energy consumption
(h) transportation

This list emphasizes facilities rather than services or actual levels of living, although it is the latter which the common man seeks as evidence of participation and sharing in the modernization process.

Consumption/production balance is achieved where there is a recognition, in the planning process, that increased levels of living, in successive steps, are a pre-condition for additional rises in productivity. Political unrest intrudes where labor perceives undue postponement in improved levels following the accumulation of capital. Given the dominant role of the state in development planning, the achievement of progressively increasing levels of living is politically and socially critical for national cohesion. Nevertheless, it does not follow that improved levels will automatically result from increased productivity. The potential for change in living levels requires the parallel introduction of modern knowledge and technical innovation.

Without broad technical assistance efforts to achieve improved levels of well-being, it could be argued that even the anticipated economic benefit obtained through reduced population growth rates might be compromised. Although per capita food availability might significantly improve as a direct consequence of a reduced population growth rate, malaria, schistosomiasis, leprosy, tuberculosis could remain as serious infectious disease reservoirs, until specific measures were instituted.

5. Social and Economic Equalization

This common development goal conceives the ideal that social and economic stratification should be changed in order to promote equality in status, opportunities, wealth, incomes, and levels of living.

Closely related to levels of living, this goal is viewed by the Pearson Commission [11] as the political problem of sharing and the implication of that sharing on national stability.

"The drive toward modernization has inevitably created conflicts between guardians of tradition and those who seek change. The controversies take on different complexions in different parts of the world but underlying all is the demand for a more equitable sharing among individuals and nations of the benefits of progress."

Equalization and sharing cannot be considered apart from the need to extend benefits in patterns of mass distribution. The challenge and dilemma of this goal is to administratively extend benefits from the small minorities to the general population through stable mechanisms or service infrastructure.

The problem affects every facet of development -- education, public administration, security, health, agriculture, and not surprisingly, nutrition and family planning.

The goal is a key challenge for technical assistance leadership.

The general assumption and expectation that modern medical and scientific technology would be widely disseminated in developing countries after World War II has not been fulfilled. For example, pure water supplies and basic health services are not readily accessible to more than 10 percent of the population of the developing world.

6. Improved Institutions and Attitudes

The articulate and educated leadership of developing countries hold generally that "social and economic institutions should be changed in order to increase labor efficiency and diligence; effective competition; mobility and enterprise; permit greater equality of opportunities; make possible higher production and well-being, and generally promote development."[12]

The dream of a united community with social and economic equality has been frequently stated as an ideal requiring social reform or "social revolution."

In turn, the achievement by government institutions which implement these ideas requires attitudes which will create the "modern man."

The desirability of changing attitudes is frequently played down in national public debate, although the issue is raised when frustration calls for more efficient labor performance or greater enterprise. Gandhi and Nehru repeatedly upbraided fellow countrymen for wrong attitudes towards life and work.

Myrdal lists the following attitudes as being highly relevant to the modernization process:

(1) Efficiency

(2) Diligence

(3) Orderliness

(4) Punctuality

(5) Frugality

(6) Honesty (which pays in the long run and is a condition for raising efficiency in all social and economic relations)

(7) Rationality in decisions or actions (liberation from reliance on static customs)

(8) Preparedness for change

(9) Alertness to opportunities as they arise in a changing world

(10) Energetic enterprise

(11) Integrity and self-reliance

(12) Cooperativeness (not limiting but redirecting egoistic striving in a socially beneficial channel; acceptance of responsibility for the welfare of the community and the nation)

(13) Willingness to take the long view.

7. National Consolidation

". . . . . a national system of government, courts, and administration that is effective, cohesive, and internally united in purpose and action, with unchallenged authority over all regions and groups within the boundaries of the State."[13]

Kingsley Davis[14] writes: "Suffice to say at this point that the requirement for cohesion within a nation is not some sort of idle abstraction dreamed up by the sociologist. It is an absolute essential of rapid industrilization in any contemporary underdeveloped agrarian country."

". . . . how is a program of rapid industrialization to be accomplished? How are poor people to be induced to keep limiting their consumption when they see shiploads of goods coming into the country and bales of money coming from government printing presses? How are they to be induced to give up their

time-honored but inefficient customs, beliefs, and techniques? How are those who hold a high stake in the old order to be liquidated or compensated without interferring with the purpose for which they are being dispossessed? How are the popular demands for equality, democracy, social security, full employment to be contained? Presumably the only way is through the sway of a dominant but new and appropriate ideology, which displaces the concern with individual wants to some higher and more collective level. To assume that the motivation to achieve economic development is itself 'economic' is a contradiction in terms. The motivation must lie outside of and above the economic if industrial development in an agrarian country is actually to take place."

The goal of consolidation is being severely tested by subcultures within each country . . . . language, ethnic grounds, and religion being the major factors in attempts for increasing autonomy, e.g., Moros in the southern Philippines, the linguistic orientation of States in India, the Chinese breakaway of Singapore.

The cohesive effect of health services on politically restless countries has not gone unnoticed by national leadership. The acceptability and popularity of health services have played a major role in the stability of new governments, e.g., mobile health services in Central America, rural health services in the Philippines (during the HUK rebellion), and the warm response of West African states to the smallpox program. One of the major measures toward national consolidation in Soviet Union following the Revolution was the wide establishment of local health services staffed by middle-level paramedical personnel called "feldshers." In India, the inability of Western medicine to provide services on a sufficiently comprehensive scale led the government to retain and support, by public demand, a separate indigenous system of medicine. The malaria program, though it stands out as a single example of its kind, is the only Indian Government service other than the census which has actually contacted very nearly every household in the nation.

8. National Independence

Independence holds a key position among the goals and purposes of modernization. The right of self-determination among groups with common bonds of history, culture, and language is perhaps the first goal which achieves the establishment of political identity. For many developing nations, the incentive for modernization was greatly accelerated following the achievement of self-government. The desire to maintain this independence, whether or not external observers agree that any threat to national existence exists, is so deeply desired that military defense expenditures continue to absorb a major proportion of annual government budgets.

9. Political Democracy

This goal expresses the desire for public participation in national government through representative assemblies based on constitutions which guarantee free elections. This goal, with its associated ideal of civil liberty, has been all too frequently thwarted. Yet, at the central level, the ideal is pursued sufficiently

to sustain the image that the national form of government has the interest or acceptance of the great majority of the people.

Although limited advances in education and limited experience in the democratic process may delay progress, it is increasingly difficult to keep the majority of national populations from hearing about government decisions and other national issues due to the extensive dissemination of news through radio, particularly the transistor radio, and the newspaper. As central government actions become matters of widespread information, concensus in favor of that government depends to a large extent on the image it creates as the protector of public welfare. Governments have learned from experience that one of the most readily understood and acceptable measures of assistance, perhaps the most rewarding in terms of favorable public response, is the promise of public services, such as health, which are manifestly protective of national well-being.

10. Democracy at the Grass Roots

"Somewhat independent of the political forms and the power basis of a national government is the degree to which it is desired that responsibility for their own affairs be delegated to local and sectional communities and accepted by the people in those smaller communities."[15]

Governments striving for development recognize that success requires a rather high degree of popular acceptance of development goals. Participation and cooperation at the local level is mandatory, a factor recognized in Title IX of the Foreign Assistance Act which refers to the need to encourage local democratic participation in the political and planning process.

11. Social Discipline

It is often held that the difference between democratic planning and those development practices held by Communist countries is that compulsion is not a value of the former. However, success of development plans may depend upon the readiness of developing countries to accept social discipline to a much greater degree than now practiced.

"Conflict arises when the modernization ideals do not have . . . . . and, with the means available in the democratic setting, cannot be made to have . . . . enough force to induce people, including the intellectual elite, to voluntarily undertake diligent efforts toward their realization and to cast aside conflicting valuations."[16]

An Appeal for Perspective

Our attempt to define modernization is not merely to approach a highly complex process by asking for a common understanding of goals. Our appeal is for the realism to see that progress of modernization is dependent on the removal of all key barriers that obstruct the closely interdependent nature of many growth factors.

In 1961, Galbraith[17] reflected the awareness of many in international development work that, even from the narrower perspectives of economic development, progress could be obstructed by the absence of critical factors such as 1) the absence of a substantial degree of literacy, 2) the absence of a substantial measure of social justice which provided for sharing of the benefits of progress, 3) the absence of a reliable apparatus of government and public administration through which planning could take place, and 4) a clear view of the total interrelated nature of the development process. Each factor, according to Galbraith, is as critical as capital.

Tinbergen[18] states this same perspective by referring to essential modernization goals as preconditions. He too refers to the essential prerequisites of 1) education, 2) internal order and security (the need for national cohesion), 3) the minimum administrative instruments for economic policy, and 4) correction of the "most extreme inequalities in income--inequalities conducive to social unrest and lack of cooperative spirit in production."

There is perhaps no disagreement that it is intellectually difficult to appreciate fully those values and interrelationships within the modernization process with which one is not familiar. That is the expected bias of specialization. But surely it is too critical to success in modernization that essential factors such as the well-being of the common man and his ability to adapt to an inhospitable physical or psychological environment should be eliminated or downgraded because such factors are not understood. Should not participation in international development be contingent on the willingness of professional leadership to recognize the inseparable relationship between development sectors?

In very practical terms, the need for an overall perspective of modernization does not preclude the continued necessity to make hard decisions on program priority. Neither does a balanced perspective obviate the need to face severe funding and resource constraints by concentrating major effort on a limited number of sectors. The issue of perspective is crucial because major gaps in the analytical base preclude informed decisions on program balance. It is simpler to think in terms of capital transfer than of technical assistance, and in terms of modes of production than in the efficient sharing and utilization of production in order to increase the levels of living.

Whether or not health, education, or community development have significant places in the Agency program priority, the Agency should thoroughly understand the role that these social sectors play in the national development process as a basis for evaluating whether the end result of productivity is indeed related to an increase in the level of living, social equalization, or other national objectives such as political cohesiveness.

At the country mission level, the Agency is infrequently staffed or structured to obtain a current factual base in all principal development sectors, particularly in the social sectors. Without this base, and an analysis of sector significance to national development goals, it cannot be said that we are clearly addressing the modernization goals of the countries we seek to help.

III. A DEFINITION OF DISEASE

In the interdisciplinary milieu of the Agency, with participation of individuals having widely varying professional backgrounds, it is unavoidable that misconceptions arise regarding relevance of concepts outside one's own professional experience. Disease is a familiar term, but what does it really connote? What is its meaning and approximate impact on nations and national development in contrast to its effect on individuals?

Disease, a highly imprecise term, denotes the state of man's inability to adapt to his internal or external environment. . .physical or psychological. The ultimate failure of adaptation is death, an end-point not easily reached due to the extraordinary ability of man to adapt to adverse conditions.

It is characteristic of the less-developed nations that man survives at the price of great inefficiency since the levels of sickness far exceed the levels of death. Although mortality may range from 10 - 40 per 1000 population per year, sickness of great variety and degree of severity may affect as many as 900 persons per 1000 population per year. The quality of man (who, oddly enough, is the sole component unit of nations) cannot be adequately measured by fluctuations in the death rate without parallel measures of his adaptive status as indicated by the prevalence and intensity of disease.

As an oversimplified perspective, the natural course of most disease is associated with little or no mortality, the greatest vulnerability being among those with the lowest natural resistance, namely the very young and the very old. To appreciate the magnitude and distribution of disease, it is useful to understand that, like the iceberg, clinically recognizable diseases represent only a small fraction of the submerged mass of illnesses which can be identified by laboratory methods but which do not produce overt symptoms.

To understand the impact of modernization on man's ability to adapt, it is useful to illustrate schematically that the degree of illness is conditioned not only by disease agents and various social causes-precedent but also by the resistance of the host.

$$\text{Degree of illness in Community} = \frac{(\text{Quantum of disease producing agent} \times \text{Virulence or strength of agent}) \times \text{Social Causation}}{\text{Resistance of man (physical/psychological)}}$$

This illustration, most easily understood with reference to infectious diseases, serves to indicate why illness and death may be greatly reduced, in the absence of medicines or health service, by nonmedical factors which increase the resistance of man such as food, clothing, housing, and psychological factors such as the management of stress. Severity and prevalence is further modified by reducing social causation through reduction of poverty, indifference, social inequality, insecurity, and by providing knowledge of the modes of disease etiology.

In 1967, J. H. deHaas [19] estimated that, of the 60 million people who die each year (worldwide), 30 million will be young children in the developing world and

another ten million will be those who die from major infectious diseases such as tuberculosis and malaria. Children, in particular, succumb for lack of resistance factors provided by adequate nutrition, excluding perinatal deaths and other factors related to the process of childbirth.

Taylor and Hall[20] have enumerated some of the principal nonmedical elements of development programs which have profound effects upon mortality reduction:

1. Improved agriculture, by providing more and better food
2. Better transportation, by reducing food loss and decreasing population isolation
3. Improved housing, by decreasing crowding and reducing exposure to disease
4. Improved water supply for agriculture. Industrial use creates availability of water which in turn improves environmental sanitation.
5. Basic education, by increasing knowledge of personal hygiene and disease causation
6. Mass media, by diffusion of knowledge.

The concept of disease, then, requires an understanding of the role of host resistance in order to appreciate that death reduction may occur independently of modern medical technology, health manpower, or health services. Host resistance alone, as described above, is a less important factor in the distribution and frequency of disease occurrence. That is, the duration and severity of many diseases may be favorably modified by nonmedical factors as described above, but the frequency or prevalence of illness may remain at high levels unless altered by preventive technology (e.g., immunization and health education) or by the availability of modern curative technology (drugs or other treatment). For example, in most developing countries, the major cause of death in children under the age of five years is diarrheal disease in association with malnutrition. Mortality can be significantly reduced by provision of adequate high protein diets, but continued infections of the intestinal tract may not disappear from a community without improved environmental sanitation, education and facilities for treatment.

The increase of host resistance alone, secondary to improved distribution of agricultural food output, can permit the reduction of mortality without necessarily improving the levels of health in terms of reduced prevalence of sickness. To prevent starvation is to prevent death, a narrow margin for survival which, in many parts of the developing world, is not always a measure of improvement in the quality of surviving humans.

Dr. J. George Harrar,[39] President of the Rockefeller Foundation, observed: "It would be a melancholy paradox if all of the extraordinary social and technological advances that have been made by man were to bring us to the point where society's sole preoccupation would of necessity become survival rather than fulfillment."

"And we must remember that improvements in public health must go hand-in-hand with population stabilization and increased food production. Unless advances in these three areas are made simultaneously and in an integrated fashion, the central purpose of life - that of human fulfillment - cannot be achieved."

The concept of disease in relation to demographic trends

In spite of the grossly inadequate data on vital statistics in most developing countries, a trend towards mortality reduction has been apparent during the past century. . .a trend which has varied widely between countries. The falls in mortality without comparable falls in birth rates have produced the differential which characterizes the high growth rates of the developing world. Although it appears logical to assume that reduced mortality could only be achieved by disease reduction and, therefore, attributable to the positive impact of modern medical technology and efficient application of public health programs, association between these variables, does not prove a cause and effect relationship. (Figures I and II)

In contrast to spread of technology and science in the Western world, the developing world has not yet felt the comprehensive impact of modern medical or health institutions. On the average, less than 10 percent of the populations in the developing world have ready access to health facilities or to the benefits of safe water and sanitation. In spite of the great expectations for improving the health of the developing world through the introduction of multiple systems which would result in preventive and curative services, such expectations have not yet materialized. The capability to mount large international programs has only occurred in the last twenty years. Only four out of hundreds of widely spread tropical diseases have been subject to sustained international mass programs: yellow fever, yaws, malaria, and smallpox. The significance of these four programs of demographic change is not yet well established. A major reduction in specific disease prevalence is to be expected, but the impact on national population growth rates is uncertain due to the relatively small number of cause-specific deaths from these four diseases in proportion to all deaths in the total population.

The WHO "Third Report on the World Health Situation, 1961-1964",[40] states that deaths due to infectious and parasitic diseases account for only 3 to 15 percent of total mortality in Africa, Asia, Central and South America. Assuming complete success in all four major campaigns (malaria, smallpox, yellow fever, and yaws), mortality would not be expected to decline more than 15 percent of total mortality which currently prevails at 10-30 deaths/1000 population. The ultimate effect on mortality decline from elimination of these four diseases would not be expected to be greater than 3 points in the crude death rate.

Table I illustrates the magnitude and burden of largely untouched communicable diseases in the Americas. The list is partial, under-reported, and excludes other major categories, for example, the metabolic, nutritional, degenerative, neoplastic, genetic, and mental disease in addition to the special problems associated with childbirth and reproduction.

Despite continuing high disease and death rates, characteristic of the developing world, there is no question that mortality has been falling long prior to the advent of mass disease programs, effective immunization, antibiotics, or the extension of modern health facilities.

Figures III and IV illustrate the trend in growth rates for the world population as a whole, in relation to the historical sequence of the application of western medical or health technology on a mass scale.

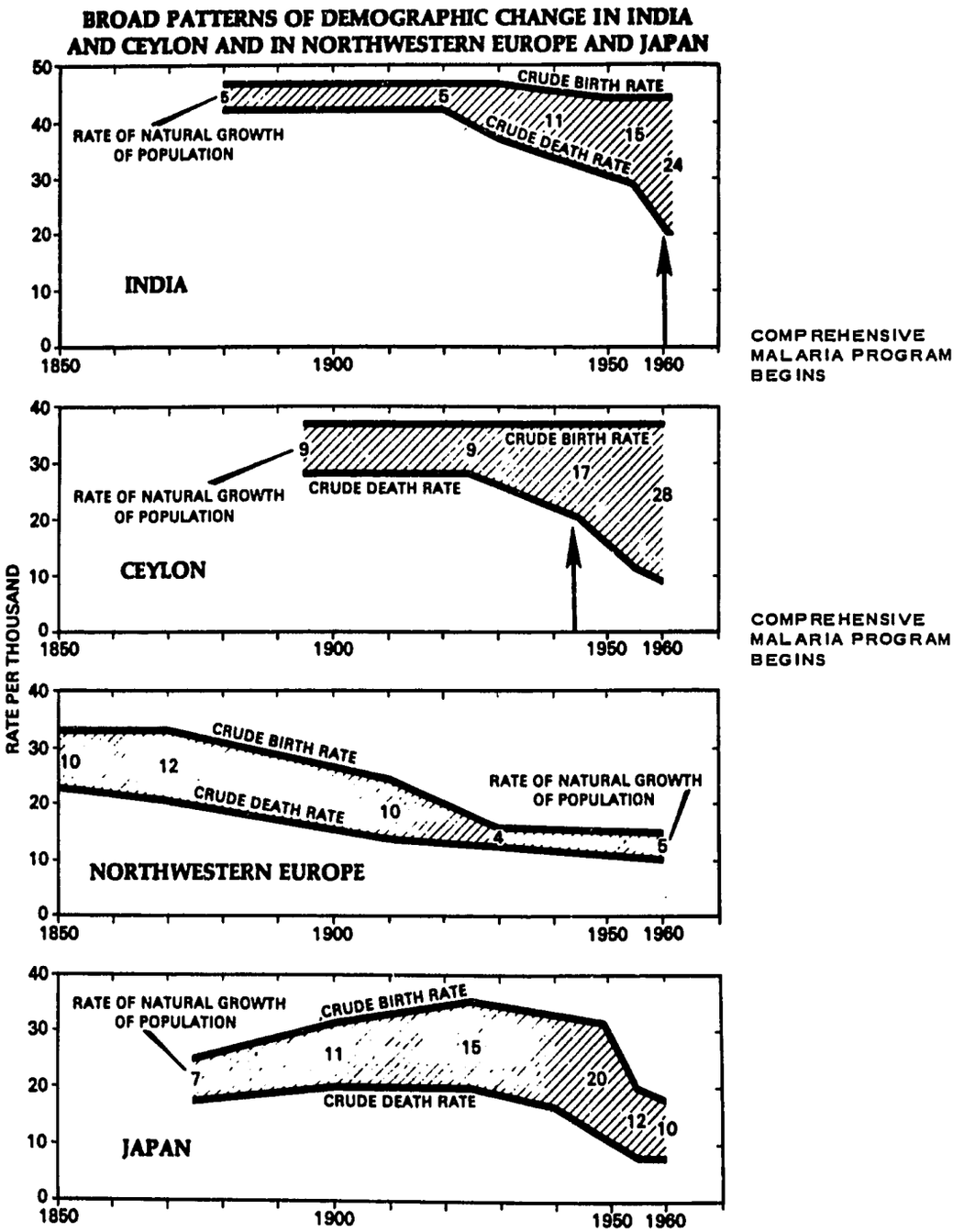
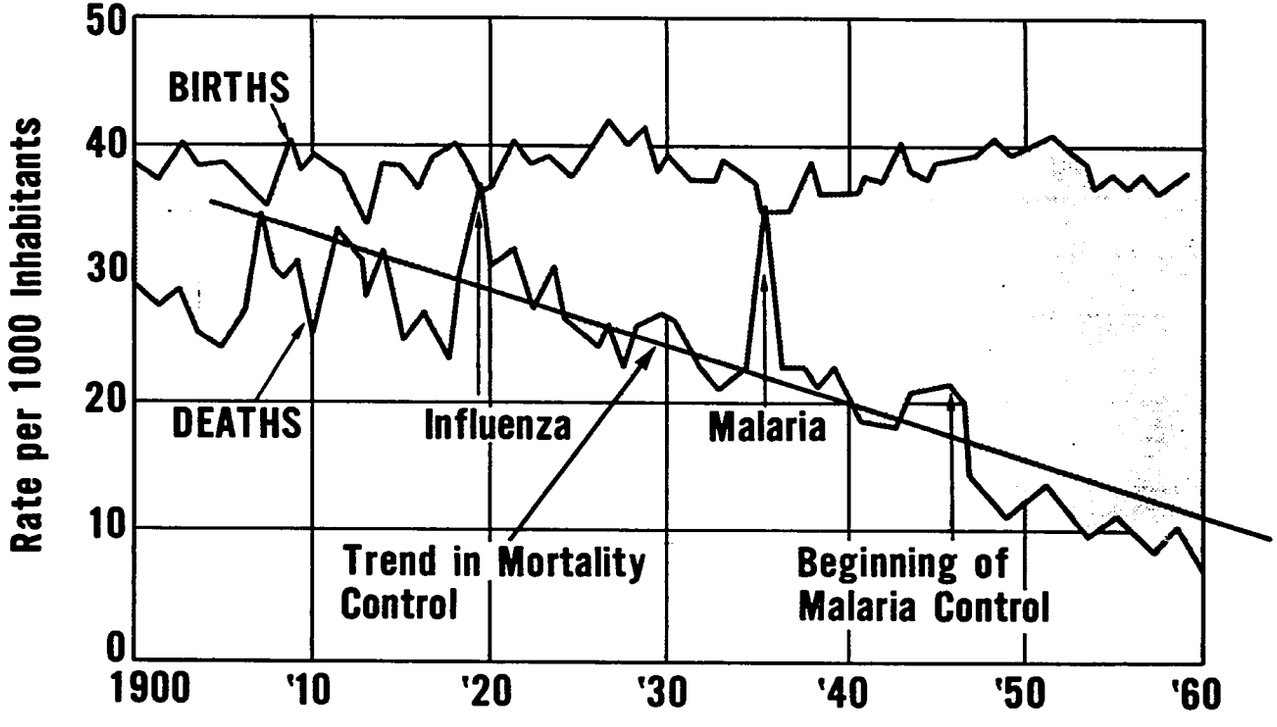


Figure I

Source: Myrdal, G. Asian Drama, Pantheon, p. 1400, 1968
Arrows added to indicate starting date for comprehensive national malaria program.

Figure II

THE BEGINNING OF DEMOGRAPHIC CHANGE IN CEYLON, 1900-1959



Source: Population Reference Bureau, Population Bulletin, Vol. X, No. 5, JULY 1954, pp. 60-61·United Nations Demographic Yearbook 1960

*Graph: Reproduced from G.Myrdal, Asian Drama, Pantheon, 1968. *Line on mortality trend and starting dates for comprehensive national malaria control added.

Table I - REPORTED CASES AND DEATHS FROM COMMUNICABLE DISEASES IN THE THREE REGIONS OF THE AMERICAS, 1965 AND 1966

Diseases	Northern America				Middle America				South America			
	Cases		Deaths		Cases		Deaths		Cases		Deaths	
	1965	1966	1965	1966	1965	1966	1965	1966	1965	1966	1965	1966
Amebiasis 046	2 819	2 969	67	56	60 092	58 080	824	1 372	28 325	22 360	* 569	* 431
Ankylostomiasis 128	4 821	3 757	2	5	* 19 115	32 310	48	47	25 018	39 119	686	628
Anthrax 062	7	5	-	-	222	152	22	7	416	420	13	14
Botulism 049.1	25	9	10	-	2	-	...	-	* 7	* 3	* 3	...
Brucellosis (undulant fever) 044	300	283	6	3	1 116	1 447	90	81	1 602	2 999	22	7
Chickenpox 087	153 831	136 214	159	* 14	49 629	19 129	123	84	50 065	59 676	* 72	* 55
Dengue 090	...	...	...	...	884	8	...	...	4 041	7 750	...	...
Diphtheria 055	215	246	24	27	1 793	1 650	448	481	5 764	6 459	671	719
Dysentery, all forms 045-049	17 917	18 231	246	184	114 485	95 350	5 702	6 001	129 379	147 719	2 264	2 145
Dysentery, bacillary, other and unspecified 045,047,049	14 998	15 263	170	126	29 340	25 312	4 642	2 574	100 783	124 678	* 548	* 541
Encephalitis, acute infectious 082	1 613	2 125	561	630	103	105	219	264	1 451	1 525	426	422
Erysipelas 052	106	102	13	15	2 086	* 598	618	432	* 802	* 808	114	128
Filariasis 127	...	...	-	-	6 468	* 5 934	1	1	* 1 769	* 2 160	1	3
Food poisoning, other 049.0,049.2	* 470	1 436	17	23	4 230	3 289	a) 179	136	* 3 604	* 4 626	a) * 93	* 175
Gonococcal infection 030-035	345 229	373 375	9	18	80 750	82 366	12	13	78 514	76 309	31	23
Hepatitis, infectious 092	40 482	38 696	806	831	15 703	15 791	622	572	9 815	13 699	505	479
Hydatidosis 125	...	...	9	10	-	-	1	-	1 733	1 788	182	143
Influenza 480-483	...	...	2 734	3 428	271 083	311 847	11 177	16 143	276 659	265 277	7 865	6 586
Leishmaniasis 120	...	...	...	...	110	306	...	...	1 832	2 943	...	...
Leprosy 060	97	111	3	6	1 026	994	67	59	3 721	3 017	156	187
Leptospirosis 072	84	72	11	9	* 17	* 47	13	19	97	91	* 3	* 49
Malaria 110-117	150	572	8	5	94 639	152 135	1 000	572	152 861	152 144	1 446	1 311
Measles 085	282 493	204 249	347	311	94 258	94 435	14 554	12 643	144 553	151 671	9 122	7 811
Meningococcal infections 057	3 128	3 466	228	214	235	228	104	69	1 634	1 556	88	120
Mumps 086	114 101	128 315	33	* 2	33 325	7 881	22	9	36 567	42 242	* 9	* 13
Paratyphoid fever (b) 041	...	...	6	* 1	2 095	2 803	283	157	* 14	* 7	* 96	* 3
Plague 056	8	6	1	1	-	-	-	-	837	991	6	16
Poliomyelitis, acute 080	75	116	17	9	1 366	1 290	348	305	2 187	2 308	273	210
Psittacosis 066.3	65	51	...	...	-	-	...	...	1	3	...	...
Rabies 004	2	1	2	2	67	78	82	93	169	133	110	100
Relapsing fever 071	...	* 5	-	-	-	-	1	1	16	203	...	...
Rheumatic fever 400-402	5 010	4 491	528	475	3 575	3 511	352	305	* 1 650	2 607	503	437
Rickettsial diseases, other (c) 102-105	281	268	17	23	-	-	49	64	72	44	602	584
Salmonella infections, other (b) 042	18 490	18 306	86	82	* 17	* 504	1 051	932	* 333	* 326	152	128
Scarlet fever 050	d) 403 767	d) 447 736	7	6	1 022	873	132	144	3 405	4 291	23	14
Schistosomiasis 123	* 305	* 288	4	3	151	108	8	-	* 3 260	* 2 731	31	36
Smallpox 084	-	-	-	-	-	-	-	-	3 464	3 565	53	33
Streptococcal sore throat 051	d) ...	d) ...	66	65	* 3 837	* 3 064	13	4	* 82 799	* 68 215	91	119
Syphilis 090-097	115 280	107 198	2 540	2 280	52 679	41 814	550	478	41 227	42 634	916	974
Tetanus 061	309	241	188	167	3 519	3 655	3 997	3 413	3 608	3 686	4 955	5 199
Trachoma 095	* 215	* 1 165	...	...	454	...	...	...	423	536	...	...
Trichiniasis 126	239	213	...	...	...	* 2	...	...	111	109	...	...
Trypanosomiasis 121	...	...	-	-	345	e) 729	7	11	2 595	3 197	* 409	* 420
Tuberculosis 001-019	53 840	52 203	8 633	8 204	45 543	37 435	12 301	12 817	72 385	77 580	15 419	16 809
Tularemia 059	265	211	...	...	-	-	...	...	...	...	...	...
Typhoid fever (b) 040	612	505	6	16	9 440	11 604	2 229	2 420	26 631	26 244	1 018	1 175
Typhus, flea-borne (murine) 101	28	33	-	...	33	51	2	-	155	139	...	...
Typhus, louse-borne (epidemic) 100	-	-	-	...	34	75	-	3	427	386	* 1	...
Whooping cough 056	9 274	12 395	64	55	45 267	41 653	8 272	8 100	106 947	68 303	5 929	5 618
Yaws 073	-	3	...	...	279	1 476	...	...	491	147	...	...
Yellow fever 091	-	-	-	-	-	-	-	-	67	304	22	26

Note: Regional totals do not necessarily include data for all the countries or the same countries for every disease or for each of the years. Figures with asterisks refer to less than 80 per cent of the regional population.

(a) Including botulism (049.1).

(b) Data of paratyphoid fever (041) for some countries are included in those of typhoid fever (040) or in those of other salmonella infections (042).

(c) Case data refer to tick-borne typhus (104); death data refer to typhus and other rickettsial diseases, (100-106).

(d) Data of scarlet fever (050) include those of streptococcal sore throat (051).

(e) Including 393 cases infected with T. rangeli.

Source: Pan American Health Organization 21/

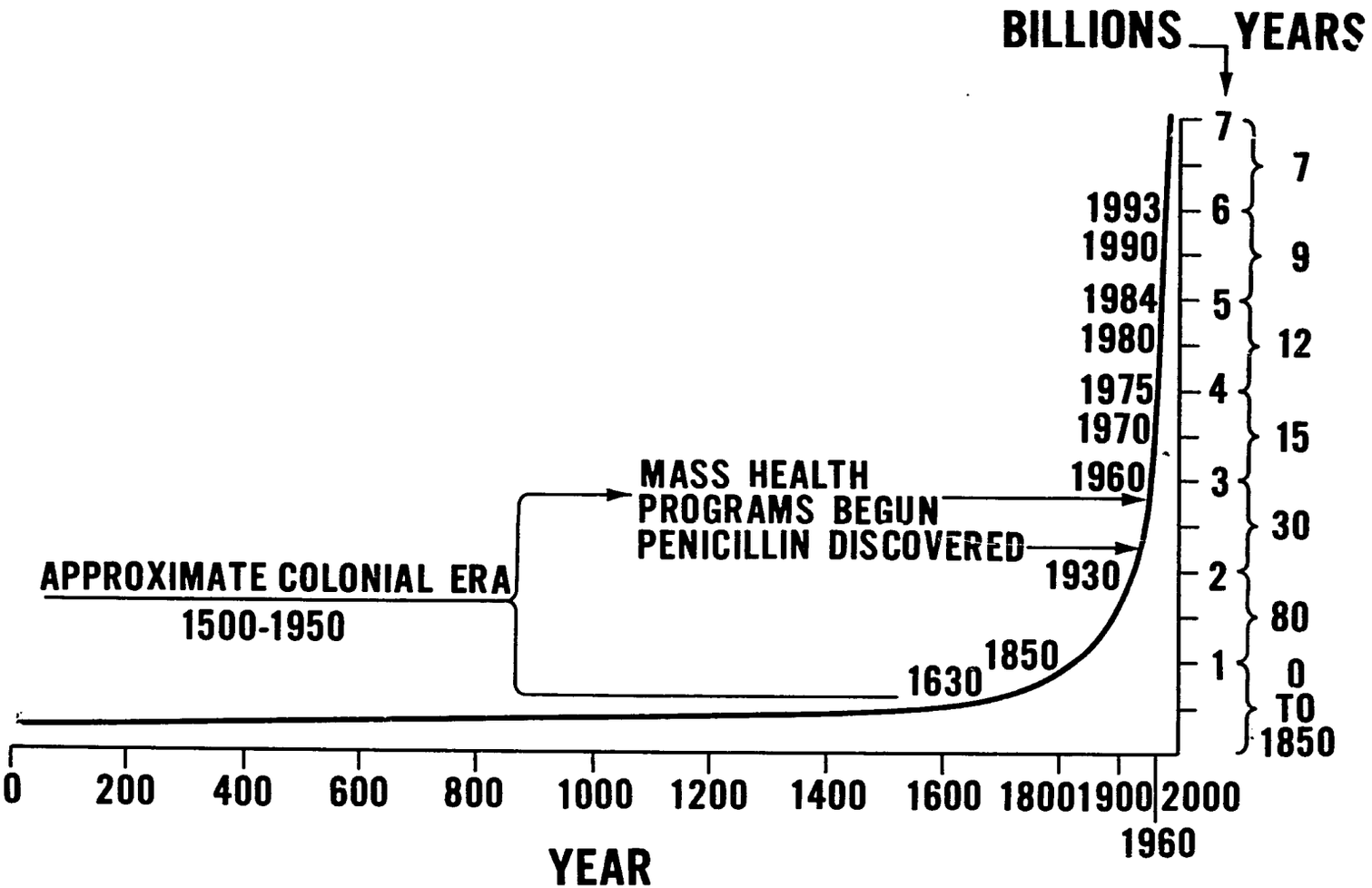

THE WORLD'S
POPULATION GROWTH
BILLIONS
YEARS
7
6
5
4
3
2
1
1993
1990
1984
1980
1975
1970
1960
1930
1850
1630
7
9
12
15
30
80
0
TO
1850
MASS HEALTH
PROGRAMS BEGUN
PENICILLIN DISCOVERED
APPROXIMATE COLONIAL ERA
1500-1950
0
200
400
600
800
1000
1200
1400
1600
1800
1900
2000
1960
YEAR

Figure III

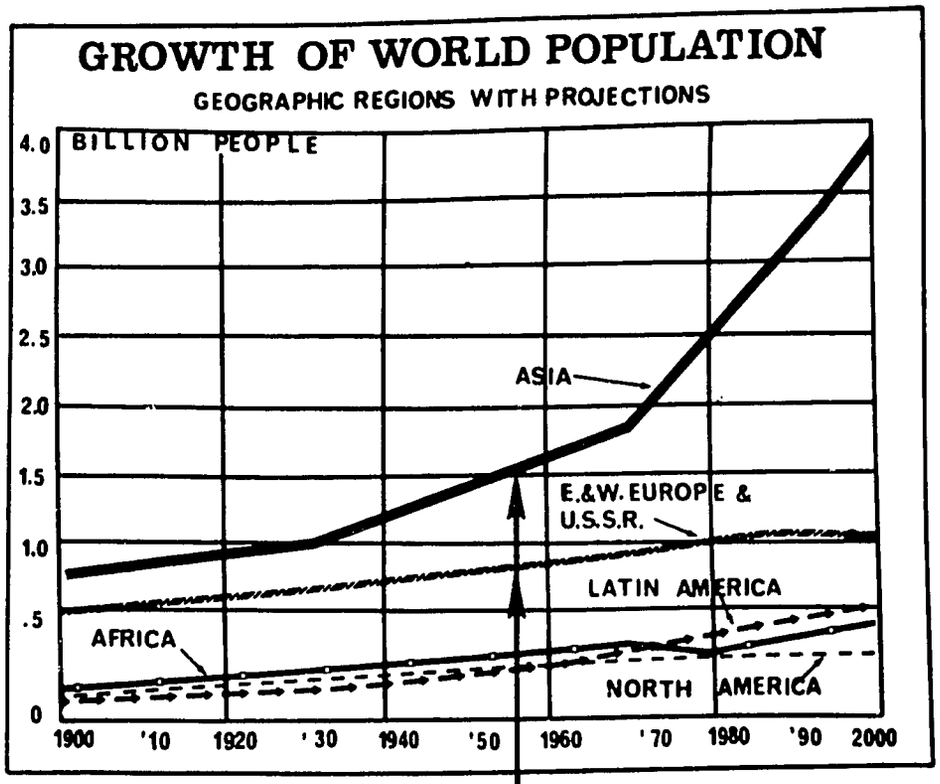


Figure IV

Source: Taylor, C. "The World, the Flesh and Harvard Man" from the Harvard Medical Alumni Bulletin, Summer 1966.
Arrows added to indicate starting date for comprehensive international health programs.[22]

Downward trends in mortality and the upward curve of population growth, clearly preceded the introduction of modern health technology on any significant scale in the less developed world. How, then, is the "population explosion" to be understood in terms of causation?

However complex the detail of such an answer may be, it is important to recognize the historical timetable. The modernization process for the developing world, associated with European colonial expansion, and beginning in the late fifteenth or early sixteenth century, provided an era of contact with the West lasting approximately 500 years. In the Malthusian context, history associates colonial expansion with the beginnings of stable government administration, the reduction of internecine warfare, the improvement of internal security, the reduction of catastrophic famines, and encouragement of food production.

Coale and Hoover [23] describe the trend in Indian population growth: "The absence of growth during 1891-1901 can be attributed to the severe famines occurring during that decade. The failure to grow from 1911 to 1921 resulted from the great influenza pandemic of 1918-1919 which was especially severe in India. In the three decades 1921-1951, the population grew by some 44 percent, or over 1 percent per annum. During these thirty years, there were no extraordinarily severe epidemics or famines." India, following World War I, saw a great expansion of road and railway development which not only improved food availability but provided an effective tool to prevent famine.

The simultaneous impact of multiple modernization factors cannot be separated from the consequent mortality decline. Resistance to disease reflected increasing food availability. Literacy and elementary education began to expand. A small but articulate and concerned national "elite" were well educated. Large irrigation programs were developed. The opening of the Suez Canal increased the international market throughout Asia for a large variety of agricultural products and, in turn, indigenous employment expanded.

Parallel observations on mortality decline in the history of Western countries confirms the influence of development programs of almost any kind; Hauser [24] attributes the decline in Western death rates from 40 to 10 over a period of three centuries to be at least one-third due to "increased agricultural and industrial productivity, higher levels of living, and settled and stable government which eliminated internecine warfare."

Providing more specific examples, Dr. Walsh McDermott, Professor of Preventive Medicine at Cornell Medical College, documents the dramatic fall of infant mortality from digestive and respiratory infection during the three decade period, 1900 to 1930, in New York City.[25] Mortality fell from 75/1000 infants to 17/1000 infants before there were any significant antibiotic drugs or specific vaccines for this purpose. The period was characterized by intensive economic and community development, educational and social reform.

IV. THE DEFINITION OF HEALTH

Few issues in the field of international development are more frequently misunderstood than the relevance of health to the modernization process. Any

attempt to define key obstacles to development which lie within the health area requires a definition of terms and some perception of how health relates to development.

The term disease has already been defined as a measure of man's inability to adapt to his environment. The improvement in adaptation, particularly at the bare subsistence level, is often more profoundly influenced by development progress in areas considered traditionally to be outside the health area (e.g., food production) than by the introduction of medical knowledge and institutions.

The spectrum of adaptation varies in a broad range from that of death avoidance to the opposite extreme of complete physical, mental and social well-being. Improvements in the measure of adaptability at the adverse end of the range, namely, the ability to survive (e.g., Zambia loses 259 infants for every 1000 live births) are those which are most responsive to agricultural, nutritional, educational and administrative change. In contrast, the achievement of modern levels of well-being, as reflected in Sweden's 12 infant deaths per 1000 live births, requires more than death avoidance. To bridge the gap, public health as a professional activity provides the science and art which seeks to assist man, within the limitations of his resources, to make a maximum physical and psychological adjustment to his own world.

Public health is not a term synonymous with death control. The World Health Organization defines health as "a state of complete physical, mental and social well-being, and not merely the absence of disease or infirmity." This positive definition of well-being is, in a very real sense, the end-point and objective of modernization. The complex of sectoral purposes, agricultural, economic, educational, political, is directed to the ultimate long-range goal, to paraphrase Hanlon,[26] of attaining the highest level of physical, mental and social well-being consistent with available knowledge and resources at a given time and place.

The well-being of mankind is what development is all about. Improvement in the quality of man's life, as A.I.D. Administrator Dr. John Hannah has stressed on many occasions, does not occur automatically as a consequence of increased productivity or means to achieve increased productivity. At some point in the cycle of growth, productivity must be shared. It must be translated into specific benefits which are perceived as modernization values: the possession of the strength and energy to work, freedom from the risk of illness, knowledge and skills to achieve a satisfying measure of adaptation to one's physical, cultural and social environment.

The parameters of health, as a positive concept of man's well-being, could conceivably include agricultural productivity, education, political stability and many other areas under the practical realization that all these factors are determinants of the status of man's health. Obviously, such parameters are too broad to be fully applied within the framework of current health institutions and organizations. Nevertheless, the concept of health, as the measure of man's well-being, requires multisectoral action far beyond traditional professional views. In this more fundamental sense, public health action may be understood as that sector of the modernization process (a) which is concerned with the quality of man himself as an individual, as a family, as a nation of families, and (b) which is concerned with man's biological, mental and social capacity to cope with his environment.

To illustrate the concept of health as an adaptive function, family planning provides one example of a public health activity which seeks to counterbalance the adverse social and economic consequences of high population growth rates. Achievement, ultimately measured by the degree of reduction in population growth rates, depends upon the acceptance and continued practice by adults of a technology or rationale that affects human reproductive physiology. The principal long-range intent of family planning is to permit man himself to adapt to the resources of his environment without increasing his poverty. In this sense, the activity represents one of the most important adaptive mechanisms in public health to achieve the modernization and health objectives of individual physical, mental and social well-being.

Preconditions for a successful family planning program will require participation of many disciplines for planning, statistical analysis, motivation, management, political support. This wide participation does not alter the basic perspective that, at present levels of technology and experience, achievement in family planning, as in the examples of Japan, Taiwan, and Pakistan, has depended very largely on a pre-existing infrastructure of health and health-related facilities (including pharmacies), and upon a substantial manpower resource of local health visitors, auxiliary nurses, nurses, private and state-supported physicians. Special training in family planning has consisted very largely of retraining large segments of the pre-existing health manpower pool or new training of middle-level manpower (family planning workers) by professionally trained health workers.

Family planning, being inherently designed to improve the physical, mental and social well-being of man (his health) is a part of the health concept and not in opposition to it.

Full appreciation of this concept inevitably suffers because it requires adjustment in the conditioned perspective of international development professionals who may have insufficient interchange with the health area. It is not unexpected, for example, that the appeal of family planning to development planners should be related to the expectation of reduced consumption in relation to production and, thereby, more rapid economic growth. Where modernization is viewed only as the production of wealth, population control will be accepted primarily as an economic objective with family planning as an instrument of international economics. Where this viewpoint prevails, individual concern becomes secondary to the welfare of the state.

The political and social risk of this more narrow perception, as the Agency has already learned from experience, is that family planning provides the opportunity but not the guarantee of well-being. Without concrete, planned measures to provide for additional knowledge and resources to improve life quality, it cannot be automatically assumed that a family of three will be any less poor, illiterate, sick, or unproductive (in the terms of earnings) than a family of five, particularly at the subsistence levels which affect community life in most of the developing world.

"In his foreign aid message, the President emphasized that the moral quality of this nation does not permit us to close our eyes to want and deprivation in this world. We believe that the programs we have developed are responsive both

to this moral quality and to vital considerations of our economic well-being and our national security." [27] If this policy is to be meaningful, the separation of population quality from population quantity as an element of A.I.D. program strategy is not only artificial but risks the political and public information credibility of stated U.S. foreign policy objectives.

In this sense, key problems of development may derive from incomplete perception of goal-concept. As with the issue of population size, the production of a ton of rice is of great immediate importance to progress of agricultural productivity in developing countries. Can it be said, however, that the physical and social well-being of the farmer who produces the rice is of less importance?

Perhaps there will be little intellectual dissent to the idea that both aspects are important, product and producer, although modernization efforts not infrequently fail to act on this perspective. In spite of traditional Western ethic which stresses individual dignity and worth, development plans and policies often focus more heavily on measures of collective welfare (national welfare) rather than the individual welfare. Agricultural production, GNP, miles of roads, newspaper circulation, export-import trade balances and other valid and important measures of progress are often stressed to the exclusion of equal measures which assess the ultimate benefit to the common man.

This perspective has led to the familiar observation that modernization can be a dehumanizing process - a process which describes man as a cogwheel or servant of a system over which he has no control and from which he receives little recognition, reward or response.

From the viewpoint of developing countries, we have shown, in Section II, that the need for political cohesion and social equalization place an unavoidable demand on national leadership to pay attention to popular demands for a share in national productivity. Ministries of Health in almost every country face the difficult task of balancing man's personal well-being with his productive output.

The notion is widely held that health programs tend to create economic imbalance by saving too many lives or by unproductive use of scarce resources in comparison to other activities which may be assessed to have a higher cost/benefit ratio. Such oversimplified viewpoints, already discussed in preceding sections, need not impair the modernization process 1) if modernization is understood as a process whereby productivity can only show sustained increase by parallel attention to improvements in the levels of living, 2) the process is understood as a matter of balance and simultaneous progress on all key fronts even though relative emphasis will vary, and 3) program focus is on quality of life with emphasis on activities which may have no direct impact on mortality rates, e.g., problem analysis, planning, organization, manpower development.

Balance does not necessarily imply major investment in the social or human resource sectors in proportion to investments in agricultural or industrial development. Balance between development programs does imply knowing what is happening to the levels of living rather than assuming that rises in productivity will be automatically shared, distributed, or used efficiently.

If the Agency is now seeking more uniform understanding of the goals of modernization, all units within the Agency should cooperatively work towards that objective. The international professional and academic community has long recognized that the practice of health, particularly the removal of barriers which impede its ability for adaptation on a national scale, requires the participation of many different professions and skills. Disease reduction, human reproduction, family planning, nutrition, environmental health, economics, social and political science are not mutually exclusive activities.

Over 200 years ago, a well-known German professor of medicine, Johann Peter Frank, made this point in a paper which he entitled, "The Civil Administrator is the Best Physician." Frank was illustrating the importance of civil administration and law in the achievement of public health.

Like other major modernization sectors, action for the health of the public requires multidisciplinary professional manpower, including such categories as biostatisticians, engineers, economists, demographers, biochemists, social and political scientists, lawyers, entomologists, parasitologists, virologists, obstetricians, pediatricians, geneticists, public administrators, psychiatrists, nurses, veterinarians, sanitarians, and even a few public health physicians. Effective community, state, or national action for health inevitably requires the participation of all members of society, irrespective of professional or vocational skills.

Responsible action on the part of health staff, including those in the related fields of family planning and nutrition, is to program the health sector in ways which clearly accelerate rather than retard modernization goals.

V. KEY CATEGORIES OF HEALTH PROBLEMS WHICH IMPEDE DEVELOPMENT

In this unit, problems are presented primarily from the global perspective of the developing countries themselves, irrespective of external viewpoints of assistance. The key problems of individual countries and a general assessment of their importance, as presented here, are based on past Agency experience, discussions with Regional Bureaus and the Technical Assistance Bureau professional staff, a wide variety of official national documents from developing countries, and on the consensus derived from the program and budget emphases of the World Health Organization as approved annually by official delegates representing 131 member governments at the World Health Assembly. Through questionnaires to 147 governments and territories, as well as reports from field representatives, the WHO has also defined those problems which should be addressed in the United Nations Second Development Decade, 1971-1980. (See Table II.)

In order to relate problems in the development context, groupings of problems are constructed around the goals and values of modernization in the specific terms presented in Section II (Perspective on Modernization). Each problem or cluster of problems is viewed as a major qualitative or quantitative impediment to one or more of these: 1) rise in productivity, 2) rise in the level of living (which includes health itself), 3) social and economic equalization, 4) national consolidation through social and political cohesion, 5) democracy at the grass roots, 6) the application of rationality, 7) development planning, and 8) improved institutions and attitudes.

TABLE II. Major health problems identified by World Health Assembly member countries and classified by numbers of identifying countries in each geographical region.

Major health concerns	Africa 28	Western Pacific 27	Southeast Asia 7	Americas and Caribbean 34	Eastern Mediterranean 14	Europe 30	Australia New Zealand Japan 3	Canada United States 2
Malaria	● 19	○ 8	○ 3	○ 10	● 8		○ 1	
Tuberculosis	○ 17	● 24	○ 3		● 10	○ 11		
Leprosy	○ 9	○ 11	○ 3					
Helminthiasis	○ 9							
Bilharziasis	○ 9							
Diarrhea and dysentery	○ 9	○ 9	● 7	● 13	○ 7			
Filariasis		○ 8	○ 3					
Deficiencies in organization and administration	○ 6		○ 1	○ 5	○ 7	● 12		○ 1
Trypanosomiasis	○ 6							
Onchocerciasis	○ 5							
Venereal disease	○ 6	○ 12		● 13		● 9	○ 1	○ 2
Malnutrition	○ 6	○ 6	○ 3	● 16	○ 3			
Environmental, deficiencies	○ 5	○ 11	● 7	● 13		○ 11	○ 3	
Smallpox	○ 3		○ 2					
Cholera (including El Tor)		○ 6	○ 2					
Meningitis	○ 1-2							
Yaws	○ 1-2							
Enteric fevers	○ 1-2							
Trachoma	○ 1-2		○ 2		○ 6		○ 1	
Infectious hepatitis	○ 1-2					○ 11		○ 1
Accidents	○ 1-2					○ 6	● 3	● 2
Respiratory virus diseases		○ 5				○ 11		
Population pressure		○ 5	○ 3					
Cancer			○ 2		○ 3	● 9	● 3	● 2
Chronic degenerative disease				○ 4	○ 3	● 9	● 3	● 2
Alcoholism				○ 4			○ 1	
Movement of people					○ 5			
Urban congestion					○ 1			
Vascular disease of central nervous system							○ 1	
Mental disorders				○ 4		○ 6	○ 3	○ 1
Narcotics							○ 1	
Dental health		○ 4					○ 1	○ 2
Indigenous population							○ 2	
Aged and chronically ill								○ 1
School health								○ 1
Handicapped								○ 1
Manpower								○ 1

Regional profiles of health problems. Developed from a questionnaire reported by the World Health Organization in *Third Report on the World Health Situation, 1961–1964*, no. 155 (Geneva, 1967), pp. 28-35. Some data were taken from a prepublication mimeographed document of the same title. The figure at the top of each column indicates the number of countries reporting. Circles and figures in columns indicate the number of countries listing the particular health problem as a major concern; a black circle indicates regional consensus that the problem was one of the most important. The vertical line arbitrarily separates less developed from more developed regions. The horizontal line separates diseases of greatest concern to less developed regions from those of greatest concern to more developed regions.

Source: Bryant J. Health and the Developing World Cornell University Press, 1969, p. 30

A. Biological Barriers

1. The High Burden of Disease

The continued growth of the human species would indicate that an adaptation or accommodation, however imperfect, has been made to the environment. This adaptation has been achieved at the cost of enormous inefficiency in population quality. A measure of this inefficiency is the extraordinary burden of disease in its variety, prevalence, and geographic distribution.

The early stage of development of statistical services precludes accurate data on illness, but there is already enough data to suggest that infectious diseases and parasite infestations, either separately or in combination with malnutrition, affect the well-being of developing populations in the order of fifty to ninety percent. The following estimates illustrate the magnitude of disease prevalence:

TABLE III

Illustrative Magnitudes of Infectious Diseases

	Developing countries (order of magnitude)
Helminth (worm) infestations	3,500,000,000
Hookworm	700,000,000
Schistosomiasis	200,000,000
Onchocerciasis	40,000,000
Tuberculosis	40,000,000
Malaria	25,000,000
Leprosy	10,000,000
Trachoma (with 1% blindness)	400,000,000

Enteric diseases (intestinal infection plus malnutrition) occur as repeated episodes in over half of the children in developing countries. Together, the malnutrition/infection combination accounts for approximately 15,000,000 of the total 30,000,000 children under five years who die each year.[19]

Source: 1) Le Riche, W. Harding. World incidence and prevelance of major communicable diseases, Health of Mankind, Little, Brown & Co., Boston, 1967. pp. 38-42.
2) World Health Organization
3) [19]

Over the last 60 years, mortality and morbidity have declined in developing countries but are not proceeding to decline at a predictable or consistent rate. There is a tendency to level off.[41] For example, a statistically significant decline in infant mortality from levels of 120 deaths/1000 births 60 years ago to a continuing level today of 80 deaths/1000 births still reflects very high rates in comparison to 30 deaths/1000 births or less in Western countries.

The levelling-off trend is noticeable in the great majority of diseases which have not benefitted from campaign efforts such as those specifically designed for yaws, yellow fever, malaria, and smallpox.

Although disease reduction is a desirable end within improved levels of living, further decline is unlikely until modern knowledge and services are distributed beyond the average 10 percent of populations which have regular access currently to some form of health-producing service. Further progress will depend on solving problems in such categorical problem areas as poor environmental sanitation, inadequate water supply, lack of health education, malnutrition, inadequate health delivery systems, limited manpower, rapid population growth, and limited resource availability. Solutions to these problems, in turn, relate inevitably to progress in other key development sectors such as agriculture, education and public administration.

Improved levels of living, as a consequence of the total modernization process do contribute to longevity and increased capacity for productive labor. It should be recognized, however, that modernization does not ultimately lead to a state of total disease elimination. The record of the last four centuries indicates that preventable illnesses, as we now understand them, can be greatly reduced. Modern man, freed from his old plagues, must learn to live with the consequences of longevity, consequences which are less well understood.

Modernization requires adaptation to a new set of physical and psychological problems, not only to aging itself, cancer, and cardiovascular diseases, but to the stresses of modern life where failure to adapt contributes to increasing anxiety, alcoholism, and mental illness.

It would be an error nevertheless to leave the impression that modernization simply replaces new problems for old ones in the same order of magnitude. Experience, knowledge and technology today permit a potential for favorable adaptation which did not exist one hundred years ago.

Neither modernization nor professional health knowledge provide the possibility for the elimination of all diseases. The present state-of-the-art in the health professions, even if allowed free reign, precludes the possibility of a millenium of disease-free existence. Total freedom from disease is not an objective. Instead, the need to adapt and live with a sense of fulfillment in an imperfect real world is a desperately important objective for nations which seek to improve the quality of life.

a) Problem: The Inefficient Use of National Resources

The current cost and continuous demand for treatment of acute preventable illness in developing countries is a wasteful use of scarce local resources where less expensive preventive measures are known but not applied.

Without attempting to discuss the macroeconomic framework in which health, as an investment in man, can be seen in relation to a variety of other development sectors, the overwhelming burden of sickness does have practical economic implications for a man and his family in the microeconomic sense.

After many thousands of years, man is usually not left without alternatives in seeking assistance for disease. When he is ill, he seeks out, accepts, and pays for treatment. The fact that a wide-spread, well-established existing health system may not be "modern", or that it is indigenous or ritualistic, does not necessarily reduce personal health costs. Under stress, man takes what is acceptable and available. In the more traditional societies, these local costs are not recorded as they do not derive from any national budget.

The introduction of "modern" medical science through local practitioners or even government hospitals do not relieve the dilemma. Indigenous practitioners flourish because they do respond to the presenting symptoms of real or supposed illness. Even when the acutely ill may ultimately seek help as a last resort from a crowded government medical or health facility, it is unlikely that all expense will be waived. It is not uncommon for government facilities to require patients to pay for their own food, special medicines and tests.

This is the pattern of curative medicine at its worst: long illness, poor facilities, high out-of-pocket costs for a category of infections that can be prevented by immunization at negligible cost, by knowledge of disease transmission, improved nutrition, and the whole range of modern technology which is referred to as preventive medicine and public health.

The fact of poverty itself and the economic trends which indicate little margin for savings are important reasons for seeking ways to reduce the high per capita costs of illness.

The total annual GNP of the 40 current A.I.D.-assisted countries is on the order of $355 billion. Government spending on health, only a small part of total national health costs, averages between 1 - 2 percent of GNP.[41] A total estimate of government health expenditure of $3.5 - $7 billion plus an additional estimate of $5 - $10 billion in private costs outside the government system would need to be verified.

The Fourth Report of the World Health Situation, prepared by WHO, suggests that the public to private ratio of health expenditures in developing countries may be as high as 1:4. With this order of magnitude, there is reason to ask whether such an investment in health is being spent in the most efficient way. Indeed, donor agency inputs in health are so marginal to estimated national expenditures that the key problem may be the management, planning and administration of existing resources.

The major obstacles to modernization from the viewpoint of a local family's own resources, as well as from the viewpoint of government decisions on the use of national resources, may be lack of knowledge to analyze, plan, and apply the most cost-effective methods.

This is an area for external technical assistance which may not require major foreign assistance financial inputs.

b) Problem: The Inefficient Use of Food Energy

Significant waste in food energy is caused by widespread infections and fevers which increase body metabolism and cause nutritional imbalance through accelerated calorie and protein use.

On an individual basis, the presence of energy-wasting infection and disease does compromise the physical capacity for work. Dr. Carl Taylor notes, "According to classical economic theory, however, in agrarian societies, such increased productivity and expanded labor force will not be readily absorbed because unemployment and underemployment are already at high levels. Recent work has all but demolished this dogma. It is currently estimated that disguised unemployment probably does not exceed 5 percent of the labor force."[28]

Whether or not the farmer's health can be translated into increased productivity, a factor dependent on education, agricultural technology, credit and many other factors, one important question is the degree to which the farmer's own individual performance is altered by disease.

The question is particularly relevant since it is not easy for development planners in Western countries to keep in mind the perspective, discussed earlier, that the labor force is chronically sick.

Herbert Pollack[29] has described the difference between primary malnutrition, which is a result of inadequate food intake to meet normal needs, and secondary malnutrition which results when metabolism is increased by disease or trauma. In the latter, the febrile stage of an infection, partly because of the high energy requirement, makes it virtually impossible to achieve the retention of protein by the body even with very high protein and high calorie intakes.

"When fever is present, the metabolic requirements of the individual are increased. It is known that the heat production of the human body increases about 13 percent for each degree centigrade or about 7.2 percent for each degree rise in Fahrenheit." In malaria, a single chill episode requires an average of 5000 kilocalories per day in the adult.

In a Taiwan study on hookworm, a parasite infection which is common in the 50-90 percent prevalence range in many developing countries, Pollack observed a weight loss, as compared to controls, equivalent to one pound of rice per man per month or 500 tons for each million adults every month.

In a more natural model of fevers, Pollack uses the example of a developing country on an average diet of 2200 calories per man per day. Assuming that 33 percent may have an acute fever episode at any one time, that 8 percent have active tuberculosis, and 90 percent have a worm burden, the energy demand would be equivalent to 7500 tons of rice per month per million people over and above normal requirements.

These calculations do not reflect additional food demand but rather the gross inefficient waste of food energy. The infected individual utilizes disproportionately high energy requirements without being able to perform his own work at more than marginal effectiveness, if at all.

Pollack concludes that:

a) an individual on a subsistence diet can be driven into malnutrition by the additional demands of disease or parasitism.
b) during the episode of fever, nutritional balance (calorie and protein balance) cannot be achieved regardless of the availability of food.

The solutions lie in identification of the specific preventable disease within the labor force, particularly in agriculture, and by demonstrating the cost effectiveness of disease prevention methods in relation to costs of medical treatment and lost earnings.

Such analyses at the local country level would need to look beyond infection and malnutrition to the less quantitively large problems which nevertheless pose major debilitating but correctable defects such as partial or complete visual loss from cataracts or trachoma. There are an estimated fourteen million blind persons in the world.

Significant food energy wastage also occurs from failure of food absorption from the intestine secondary to continuous food and water pollution. In contrast to energy loss from infection following absorption of food into the body, the problem here is food waste from causes which preclude or inhibit absorption from the intestinal tract.

Economic reasoning, as applied to agriculture, should include an analysis of all variables which affect production, distribution, and consumption. Agricultural losses are customarily defined in such terms as crop spoilage, loss in transportation, rodents in warehouses, etc. All reduce effective yield prior to consumption by the human.

However, food is not really "in" the body until it is absorbed from the intestine.

There is now evidence that, in developing countries, absorption of various nutrients is compromised for a variety of reasons, one of which is a barrier which develops in the intestinal wall following years of exposure to an unsanitary environment. Whether the changes are due in part to parasites within the tract, or to bacteria and virus infection which may occur over a long period, is now the subject of research.

If it should be discovered that protein and calorie consumption is unutilized by even as little as 10-15 percent, this finding would pose a serious problem where food production may already be reduced by pre-consumption losses up to 50 percent as has been reported in parts of India.

For this problem it would appear that solutions lie in improvement of man's environment through water protection, waste disposal, and public education regarding the consequences of continuous contamination of food, water, and soil with human intestinal wastes.

c) Problem: Inefficient Use of Arable Land

Many developing countries are unable to optimally utilize potentially arable land due to the presence of vector-borne diseases such as malaria, schistosomiasis, and onchocerciasis.

Table IV identifies 7.8 billion acres of potentially arable land, approximately twice the acreage now in use. In some of these areas, removal of health obstacles will serve as a precondition for optimal development:

Malaria: Historically this disease has precluded land development where natural conditions permitted the breeding of mosquitoes under conditions which permitted a high potential for transmission. Anti-malaria programs have reclaimed the foothill area of north India and agriculturally productive plains in Thailand.

Major settlement population in the inland hilly malarious areas of the Philippines has been possible only since major reduction of the parasite reservoir occurred within the general population.

Trypanosomiasis: Much of Central African land is unused due to the tse-tse fly and the sleeping sickness which it transmits. Agricultural efforts at vector control are being attempted because of the adverse effect of the fly on cattle.

The problem, far from solved, requires more effective methods of treatment and prevention. Research in this direction is limited.

Onchocerciasis: Forty million West Africans are precluded from farming fertile river valleys because of the Simulium fly and the filaria-like worm it transmits. The frightening complication of this disease, which has very little mortality, is blindness from migration of the parasite into the eye.

These examples illustrate some of the better known of land/health problems. The issue has not been sufficiently studied on a global basis and merits analysis in order to direct efforts towards better land settlement.

d) Problem: The continuing high burden of disease and death in infants and children is an effective obstacle to the rapid acceptance of family planning services.

Aside from the major administrative, organizational and motivational problems discussed later which bear on the whole question of delivering requisite services on a comprehensive scale, one of the major barriers to acceptance of family planning is the high burden of illness.

TABLE IV

"CULTIVATED" LAND ON EACH CONTINENT, COMPARED WITH POTENTIALLY ARABLE LAND

CONTINENT	AREA IN BILLIONS OF ACRES		
	TOTAL	POTENTIALLY ARABLE	"CULTIVATED"
AFRICA	7.4	1.61	0.39
ASIA	6.76	1.55	1.28
AUSTRALIA AND NEW ZEALAND	2.03	0.38	0.04
EUROPE	1.18	0.43	0.38
NORTH AMERICA	5.21	1.15	0.59
SOUTH AMERICA	4.33	1.68	0.19
U.S.S.R.	5.52	0.88	0.56
TOTALS	32.49	7.88	3.43

Source: A.I.D. Technical Assistance Bureau--Office of Agriculture 1969

We have already pointed out that 30,000,000 out of the world's total annual deaths of 60,000,000 occur in children under the age of five. The high infant and child mortality indicate only a small fraction of the illness created by the twin forces of malnutrition and infection.

To expect rapid progress in family planning acceptance by those who are faced with the high levels of morbidity and mortality in their own environment is to discount the reality of experience. Fertility and infant mortality usually show a close positive correlation.

Health services, modern or traditional, do have the grass roots acceptance of developing countries. It is generally acknowledged that the most receptive time for presenting the need for family planning is following childbirth.

According to the consensus of the 131 members meeting at the World Health Assembly, the need to promote family planning in the milieu of family protection is well accepted. Most governments which have an official policy are extending programs through health services. The problem from the viewpoint of developing governments is not fundamentally a question of the appropriateness of using health services but one of finding rapid innovative ways to extend services since the existing systems have so little coverage.

e) Problem: Well established knowledge of disease causation and disease prevention is unknown to over half of the developing world. This deficiency precludes man's ability to achieve an efficient adaptation to his environment within the constraints of his limited resources.

How are developing countries to reconcile their progress with the inhospitable environment? While a few diseases will prove susceptible to elimination, the broad range of infectious diseases will remain.

The total elimination of all disease is not a realistic objective. It is hoped that development planners will recognize that such an objective is not proposed by the public health profession. Rather, the profession has sought the fullest progress towards objectives which are technically, financially and administratively feasible.

Reconciliation with the environment begins with the first principle of modernization: rationality. Here is the obvious need to rely on the basic process of education, and its local institutions to train those who will seek to understand the specific cause of disease in specific countries.

Understanding is the first step towards adaptation. For any country to ultimately stand on its own feet, there must be understanding of disease causation.

In no way related to lack of resources, man has created many of his own problems for lack of understanding. Malaria was disseminated throughout India by railroad and highway labor because the engineers did not realize that the "borrow pits" on the side of the road from which earth was removed would provide ideal mosquito breeding sites.

Schistosomiasis in North Africa continues to be disseminated by irrigation channels which spread the snail host.

Resistance of mosquitos to insecticides in Central America emerged after extensive and repeated use of aerial insecticide sprays by private entrepreneurs.

Enteric disease persists because much of the world doesn't know that there is such a thing as a germ. Cleanliness, personal hygiene, prevention of food and water pollution can be taught.

Adaptation, in the last analysis, will not depend entirely on an armamentarium of modern technology or upon progress in technology. As Dr. Rene Dubos[41] has warned us, technological progress brings its own problems, replacing one set of issues with others, e.g., chemical pollution of the air and water, alcoholism, drugs, increase in genetic abnormalities.

Reconciliation with environment, to minimize the prevailing dangers whatever they may be, places a great stress on the need for education and communications.

Problem solving capability, on the part of leadership of developing countries, is probably of greater importance to successful adaptation than any other single program activity. This view is based on the notion that adaptation will require a blend of action which includes key elements in many development sectors which contribute to well-being.

2. Problems Related to Rapid Population Growth*

Problem: Measurable reduction in national growth rates will require cooperation of the majority of fertile couples during the greater part of their reproductive years, perhaps a period of 25-30 years.

The magnitude of the challenge is seen in the requisites for achievement:

a. Effectiveness of contraceptive technology - Effective methods exist, but, except for sterilization and IUD's, the need for repetitive use compromises results in the absence of periodic supervision. Current technology is still highly limited when seen from the perspective of a family which seeks to have no more than two children over a period of 25 to 30 years.

b. Acceptability of contraceptive technology - The side effects of many methods, particularly hormonal treatment and IUD's, reduce acceptance even though the actual physical risks may be comparatively small. Public reactions are difficult to correct in absence of trained personnel.

c. Accessibility of family planning services - Requisite cooperation over the entire male and female reproductive period requires access to an infrastructure through which services can be made available. Such accessibility

*Within the Technical Assistance Bureau of A.I.D., population problems will be defined more fully by the Office of Population.

implies nation-wide geographical coverage as well as availability of trained personnel. Currently less than 10 percent (on the average) of developing populations have access to an adequate distribution system of requisite services.

d. Affordability of family planning services - Long-range, open-ended requirement for services, when taken into consideration with limited national resources for providing services, precludes the establishment of duplicate delivery systems, one for health and the other for family planning. Accordingly, because of resources restraints, most developing governments have opted for provision of services through the health infrastructure.

e. Motivation - Illiteracy, poor communication, and the continuing high burden of disease and death in young children pose major problems for the rapid acceptance of family planning services.

Within the modern context of health, family planning represents one of the most important adaptive mechanisms in public health to achieve the modernization goal of individual physical, mental and social well-being. The reduction of population growth rates, on a national scale will depend ultimately upon the acceptance and continued practice of the fertile couples, throughout their reproductive period, of a technology or rationale that affects human reproductive physiology. The technology must be applied with sufficient effectiveness and motivation by the acceptor, so that during the twenty-five years of reproductive potential in the woman, or longer in man, there will not occur, on the average, more than two live births per couple. The assumption is that the pill, IUD, and other evolving contraceptive practices will need to be applied over a reproductive lifetime.

To obtain this degree of understanding and motivation, to provide an effective method which is safe over a very long period, and to apply the technology to a sufficiently large population both in space and time under widely varying cultural, political, and geographic conditions is a supreme challenge.

In the development context, the effort will require the fullest cooperation of all development sectors if ultimate evaluation is to record any significant change in growth rates.

Notestein, Kirk, and Segal[31] observed, "No efforts of social-economic development can be useful in a disease-ridden population, nor will a desire for small families be likely to emerge. Better health and improved chances for survival of the individual child lie at the root of the motivational change we are seeking."

This issue has already been faced in the World Health Assembly by the 131 constituent member governments. As recently as July 1969, there was consensus that the appropriate framework for family planning in developing countries lies within the national health infrastructure. The reasoning, partly economic, is that few countries can afford the manpower, facilities, or funds to duplicate existing health services in order to develop separate comprehensive national family planning services. The concept of integration of family planning within the health structure is therefore the trend. For example, in rural India, it is the health physician at the modest primary health clinic who has the responsibility to deploy the personnel who extend the program to potential acceptors.

The broader rationale for integration of health and family planning services at the operational level derives from acceptance by national leadership that only low birth rates matched by low death and disease rates will maximize the investment in human resources, minimize the burdens of dependence, and yield a final outcome which is politically acceptable.

Dr. Harald Frederiksen stated the rationale this way "Health services by their effects on morbidity, mortality, and fertility, can accelerate and must complete the historic process of economic and demographic transition from low to high levels of production and consumption; from high to low levels of mortality and fertility by restoring balance between mortality and fertility at the lowest level of mortality and the highest level of health attainable with the available resources."[32]

The need to fully utilize health services has now been urged as official Agency policy in support of family planning. This does not avoid the need to mobilize many other alternate resources for communicating, motivating, distributing and administering population services. The operational dilemma is that existing distribution channels are inadequate for comprehensive delivery. Health services in most developing countries, even through modest rural clinics focussing primarily on preventive work, are still too limited in distribution to reach, as a general average, more than 10 percent of fertile couples.

What are the alternatives? Emerson Foote, after a consultant tour of India during 1969, observed that only 10 percent of the rural Indian population had "received the word."[33]

While alternate systems of delivery services should certainly be explored, the relevance of the national health system should not be misunderstood. Developing nations see health care as an acceptable non-controversial commodity. Family planning provided through the health infrastructure permits an appropriate social setting to counteract the recurrent political interpretation in developing and developed countries, that family planning services in the absence of family protection or health services constitutes discrimination along racial or other factional lines.

The problem of image is a real one for which there are few satisfactory answers in those situations where arbitrary separations between health and family planning are made.

A 1969 panel discussion in New York on the subject of "Tropical Medicine and International Diplomacy" found A.I.D. under severe criticism for allegedly making family planning a condition of assistance to African countries. The erroneous notion was corrected, but the impression apparently persists as a public concern since it is not widely understood that funding constraints have severely restricted Agency actions in social sectors other than family planning.

The problem need not continue. First of all, the population growth problem will exist indefinitely. The long-range institutional capability to deliver service must be provided through an effective delivery system. The current state of existing health services, being a reflection of past action and not future needs, can be adapted to provide the requisite service.

There appears to be no illusion about the enormous global demand for health personnel to provide family planning services: 50,000 physicians, 200,000 paramedical personnel, 350,000 field workers. (TA/POP estimates) Where are these people to come from?

As long range plans are formulated which place an increasing demand for facilities and personnel, it is necessary to evaluate the impact which this "consumer" demand places on existing health services. The health system of a nation is best understood as an ecosystem, public and private, providing and consuming services. Service consumption creates the demand for personnel, who, in turn, must be trained in the professional schools and training centers, or trained from existing sources. If personnel have multipurpose functions, training requisites become more demanding.

The task can be done, but it requires insight into the whole health pattern of a country. This does not mean that a country must have a completely established health infrastructure before beginning to carry out a family planning program although past experience does not suggest that population growth can be slowed on a national scale in the absence of a comprehensive operating system through which services can be made available. The need is for careful analysis of a country's total health requirements so that precipitous imbalances, which decrease a nation's limited capability to cope with its own environment, are not unnecessarily created. The issue, as always, is that of balance—a balance that represents rational choices based on more than partial information. It is this analytical prerequisite which should be the groundwork of any total development plan.

In view of the rapid and favorable progress towards obtaining leadership and government approval for family planning, with increasing numbers of governments officially or unofficially approving population policy, the time is at hand to assist governments in practical approaches to extend services to progressively achieve national coverage. Donor agencies cannot adequately respond to direct appeals for provision of comprehensive service systems since donor resources are still marginal to the requirements of developing countries. Governments themselves, on the other hand, for reasons of social and political equalization, have no alternative but to expand services as widely as possible, within constraints of available resources.

The United States does have considerable experience in organization and extension of direct health distribution systems. United States domestic and international experience in providing these services can and should be brought to bear for adaptation to the needs of developing countries without any illusion that U.S. experience is directly applicable.

Within the multidisciplinary environment of development planning agencies such as ours, it is not easy to correct the erroneous impression that a health system must consist of a fixed base organization with expensive modern hospitals and laboratories. To the contrary, the general direction for need overseas, subject to individual country requirements, is for a highly flexible delivery system consisting of simple, inexpensive, primarily preventive health posts or service points staffed by locally resident middle-level manpower, including the mobile or circulating local health visitor. The effective system will be mobile

enough to meet needs of prevention as well as those demands for personal care such as childbirth which require a fixed base.

3. The Problem of Malnutrition*

Problem: As a health issue of the first importance, malnutrition does pose a key barrier to modernization. Seen in terms of modernization goals, the expectation of national consolidation, improved institutions, or qualitative improvements in levels of living cannot be realistic if the generation that leads and works twenty years from now is compromised today through childhood malnutrition.

The Food and Agriculture Organization Third World Food Survey estimated that half of the world's population, or between 1,000 and 1,500 million people, suffer from either undernutrition or malnutrition, or both.

No country will be entirely devoid of the privileged minority who have access to food, education, and good health. The reality that 90 percent of developing nations do not have access to these benefits presents the dilemma that the effects of malnutrition become indelible before the age of five, a dilemma with consequences for the quality of the next generation. The Pearson Commission[34] notes that the physical and mental development of this generation is of "central importance to the whole process of development."

If fifty percent of the total annual worldwide deaths occur in children under the age of five (30,000,000), the indication is that the children of developing countries are making a very poor adaptation to the challenge of their environment.

The specific impediments are malnutrition of two types:

a) Primary malnutrition — This is the result of inadequate food intake to meet normal demands. The bulk of the world effort is directed towards this food shortage/calorie and protein shortage issue. It is generally understood, however, that total calorie availability is not so serious as the shortage of required nutritive components in the diet. These deficiencies can be corrected by supplementation, fortification, or nutrition education which encourages use of natural supplements which occur in most environments.

b) Secondary malnutrition — This form represents increased metabolism, protein loss, and high energy-consumption induced by disease or trauma. Heat production secondary to fever increases by 7.2 percent for each degree of rise in Fahrenheit temperature. During the fever stage, it is virtually impossible to replace protein. A single malaria chill in an adult uses up approximately 5000 kilocalories a day, the energy ordinarily required for two days use under average conditions.[35]

Dr. D. B. Jelliffe,[36] the tropical nutrition expert who has spent most of his years in Africa, notes:

*Within the Technical Assistance Bureau of A.I.D., the Office of Nutrition will define the nutrition problem more fully.

"Protein calorie malnutrition of early childhood is most realistically regarded as the result of ecological imbalance rather than exclusively as a dietary disorder.

"Responsible ecological factors will vary from one part of the world to another. However, as a generalization, it is rare for this group of conditions to be due to primary dietary causes alone. They are usually associated with various medical conditioning factors including intestinal helminthic (worm) infections, tuberculosis, diarrhea, respiratory infections (including whooping cough) and probably hyperendemic malignant tertian malaria, as well as various social processes as, for example, the psychological stress of a breast weaning, failure of the lactation due to mother's working in the urban regions and the breakdown of traditional family spacing techniques."

The problem of malnutrition in developing countries, to be understood in true context, is a process which, most frequently in pre-school children, is precipitated by environmental factors other than the availability of food. It follows that improved diets, and better food distribution are not likely to achieve significant gains in nutrition where parallel measures do not reduce the diverting energy demands of infectious disease and poor infant care.

4. The Problem of Environmental Pollution

Problem: The pollution of soil and water with human wastes, and the subsequent contamination of food and drink, produce infection which, in combination with malnutrition, lead to the largest single category of disease in children.

Progress in environmental sanitation has not expanded on a sufficient scale to cover more than 10-15 percent of developing populations, although wide variations do occur with greater progress in some countries. Specific measures for preventing the high burden of disease and malnutrition in the pre-school child through environmental sanitation will need to be applied vigorously if either family planning or malnutrition programs are to demonstrate measurable gains in their national objectives.

It is well known that many major disease impediments to man's well-being are of his own making, and that these in turn constitute barriers to the acceptance of family planning. By far the major source of man's infection is through pollution of soil and water by his own wastes. Measureable progress, on a national scale, in disease control, family planning, or nutrition cannot proceed rapidly or economically without measures to protect human food and drink from pollution.

Protected water supply and safe disposal of sewage and waste is now extended to an average of about 10 percent of populations in developing countries with the largest deficiencies in rural areas where the great majority of populations reside. Further extension is limited by constraints that affect most other development sectors: Resource limitation, manpower shortage, and a technology that still needs major improvements in cost reduction.

Without waiting for these changes, however, major change in disease reduction can occur with effective health education, both as a specific activity of national health systems and as a component of the general educational system.

Personal hygiene and elementary home sanitation is a cumbersome process but it is an effective and inexpensive measure for governments to undertake through the channels of the national health system.

The equally important issue of environmental pollution from industrial wastes and chemicals is relevant to identify, although leaders of the developing world are not yet fully persuaded as to relative importance of pollution with a potential but unproven disease hazard to humans when seen in relation to the immediate disease hazard caused by disease producing soil contamination from human waste.

B. The Administrative Barriers

1. The Problem of Instruments

In the foregoing analysis, we have dealt with three inseparable factors that affect the well-being of the common man — the burden of sickness, the burden of his reproductive process, and the impact of inadequate nutrition. We have also referred to external environment as a common source for his own dilemma.

The next group of problems relate to the organizations and administrative arrangements and capabilities for seeking solutions.

a) Planning capability

Problem: Most developing countries do not now have sufficient professional training or an operational mechanism for obtaining adequate information on total national health problems or for undertaking problem identification, analysis, and planning. This deficiency precludes the making of informed decisions on efficient utilization of the countries' own resources.

Modernization is based on the premise that rationality will be applied in some degree and that rational development planning is an outgrowth of adequate problem perception and analysis. Yet, few countries have the opportunity to make informed choices on the basis of adequate information on the health system, since few governments make the requisite health analysis. As a result, there is little evidence to believe that governments have the requisite basis for making appropriate choices in the wise use of their own resources.

The need for external assistance cannot be easily determined in the absence of trained capability on the part of the recipient nations to perceive and identify its own problems.

If as much as three to seven billion dollars of local resources are being spent on health services by developing governments in addition to the very large private expenditures for health care which are not brought to the attention of the government, there is a need to establish, for each government, a planning organization which can analyze its own situation. The poverty of nations, declining resources, and the narrowing margin for savings are all factors which make planning more rather than less important.

b) Delivery capability

Problem: Few developing countries have the organization, administrative structure or staff to operate a comprehensive nation-wide health delivery system which is regularly accessible to more than 10 percent of the total population.

To be unambiguously clear on the concept of a health distribution system, such a system is not defined or limited only to a system of clinic-oriented preventive, curative, and related supporting services such as pharmacies but to public services and investments which are specifically designed and adapted to yield a health-producing result. Such programs would include elements such as environmental sanitation, pure water supply, public information, and food quality improvement.

There is an inevitable overlap with the sectoral thrusts of traditionally non-health sectors such as agriculture, education, industry, and development administration. While these sectors do profoundly affect man's health and well-being the related sectoral institutions and organizations have broader professional, commercial, educational objectives which cannot be categorized exclusively as being "specifically designed to yield a health-producing result."

As a modern trend, Western concepts of health administration have gone quite far — in a qualitative sense. Almost all governments have made an organized beginning through official ministries or departments of health. Some form of health system exists, however inadequate. International recognition and coordination is encouraged through the World Health Assembly which convenes 131 member governments annually.

The rudiments of a Western system with curative facilities exist in urban areas. Yet, the absence of a distribution system which is readily accessible to more than an average of 10 percent of the total populations in A.I.D.-assisted countries precludes the type of programming which is designed to achieve measurable national impact on disease reduction, population growth rates, improved nutrition and other modernization goals such as social equalization through distribution of government services on a comprehensive scale. Unless highly mobile programs are required, as in the case of rapidly spreading epidemic disease, it is the extended health infrastructure, as a complex of flexible mobile health-yielding activity systems which permits community action to modify the disease/nutrition burden and its adverse effect on lowering population growth rates.

As the poverty of nations precludes elaborate facilities where health services may be most needed, considerable careful thought has already been given to the requirements for simple, culture-adapted systems of inexpensive units through which health services can be delivered.

Since member governments to the World Health Assembly have already agreed to the principle and policy of integrated health/family planning/nutrition services, the challenge to Western countries is to provide professional experience which can be usefully applied to nations in need of service extension.

c) Administrative capability

Problem: Public administrative and management skills are acutely short and require continued training emphasis.

d) Cultural barriers to extension of Western-oriented systems of health

Problem: The expansion of family planning, nutrition, disease control or other general health systems is impeded by traditional health systems which are in full operation and which have the confidence of the common man in developing nations.

To compete for the confidence of the common man requires tangible demonstration of the technical superiority of Western medicine. The health clinic, however simple, offers a highly favorable milieu for accomplishing the transition from traditional medicine since the clinic can respond, like the traditional systems, to perceived needs.

Health systems of the indigenous variety have always existed on a comprehensive scale. Twenty years ago, Dr. Henry Sigerist, the late Professor of History of Medicine at Johns Hopkins, warned that such systems should not be criticized until Western medicine is prepared to replace them with something better. Twenty years later, the record of replacement does not demonstrate rapid progress.

The two systems, with all their variety, form a very sensitive interface between the Western concept of rationality and the non-Western a-rational system. This is not to suggest that indigenous medicine does not contain a great deal of practical wisdom, but it does mean that local systems are not primarily based on a current understanding of biology, physiology, or modern science.

To replace these currently entrenched and popular folk systems of health, Western medicine and health science will have to demonstrate that its product is superior to old ways.

Belief in indigenous systems and in its practitioners effectively impedes the acceptance of modern technology, whether that technology be a claim to better treatment, birth prevention, or correction for malnutrition. The germ theory has not reached most of the world. Western science, penicillin, the pill, and IUD are very much a minority system.

Development of effective instruments, therefore, in any of the health emphases will require a milieu through which it can be presented. Acceptance is most likely to come from those who are recognized to be the health practitioners, whether such an individual is a nurse, local health visitor or doctor, because the professional can demonstrate the effectiveness of modern technology and thereby earn the confidence of the common man.

If a family unit in a developing country, having many problems, approaches a Western facility because a child is ill with typhoid fever, he is unlikely to be assured if he is advised that such assistance is not available, but that he can be provided with advice on how to build a latrine, or that contraceptive methods

can be provided to avoid having another child with typhoid. The point is that human needs must be addressed, however inadequately or imperfectly. And the system that responds more adequately to felt needs will likely receive the support of the population. It is this type of consideration which requires that developing governments begin to use a simple basic health infrastructure as its motivational approach to achieve the rapport through which preventive measures, such as family planning, can be applied.

2. The Problem of Manpower

Problem: The constraints on extension of health services, the distribution of family planning services, and failure to achieve anticipated reduction in preventable disease are closely associated with quantity and quality of manpower.

Progress towards improving the manpower resource is frequently constrained by incomplete analysis of total national health manpower requirements.

The health manpower issue was comprehensively reviewed by the American Association of Medical Colleges in 1964-65 at the request of A.I.D. Excellent recent analysis is contained in a Rockefeller Foundation sponsored report written by Dr. John Bryant: "Health and the Developing World."[37]

It needs to be said, for emphasis, that the major pool of health manpower in the developing work is the indigenous, untrained, practitioner of traditional medicine. The practitioners of modern health may average one doctor and nurse for every 50,000 to 100,000 rural population. The average population per physician varies from 390 in the Panama Canal Zone to 102,000 in Ethiopia.

Where medical shortage is severe, the need for paramedical or auxiliary workers is an inevitable necessity. Western nations rely on a ratio of around 10 supporting personnel to every doctor. Developing countries may have one or less.

The limited extension of health services, the slowness with which family planning coverage is being achieved, the trend towards levelling-off of disease prevalence at high rates, are indications of the acute shortages in trained manpower of all varieties.

As a function of planning, manpower reflects the demand for health services, a demand which so far has favored urban areas where opportunities for public or private employment are greatest. Enormous discrepancies in manpower distribution parallel the differences in the urban/rural distribution health facilities.

The inadequacy of the professional training schools to rectify the imbalance is generally understood. Trends now prevail to revise curricula in favor of conditions and needs in developing countries rather than those in the West.

When large special demands for professional services occur as with family planning, it cannot always be assumed that there will be sufficient numbers of personnel to be retrained or diverted from existing programs. At some point in time, the schools must adjust to the increased demand both in quality of training and in numbers.

The key obstacle to progress is not that a given short-range priority demand cannot be met from existing resources, at least for initial requirements, but the failure to assess a country's health system, private and public, as a whole ecosystem in order to make long-range adjustments for diversion of large blocks of personnel. The practical issue is, in a sense, the need to meet the total personnel requirement of any long-range operational program. For example, if future planning needs require manpower on the order of 50,000 doctors and 200,000 paramedical personnel, thought must be given to the additional load this demand will create on the professional schools and training centers.

Concern for the professional school in developing countries is valid on another point. If the concept of national independence is to apply, self-help in the true sense, the developing nation must evolve its own leadership and professional competence. After 20 years, budgetary and ceiling constraints have left A.I.D. with little continuity of experience in medical or health education. The World Health Organization is increasingly drawing its staff from experienced members of developing countries themselves. In the long run, there appears to be no alternative except for developing countries to solve their own manpower problems with their own resources.

Given the experience and capability in planning scarce resources, developing governments can probably provide the capital for institutional development. The area of greatest need is for technical assistance activities which transmit the experience of the West in curriculum development, teaching methodology, and faculty exchange when required to strengthen a particular department. With current heavy emphasis on curative medicine, the educational system requires a great deal of practical assistance in developing departments of preventive medicine, community medicine, and public health, an essential part of which must be training in family planning and nutrition.

The brain drain is another issue which should be our concern because of its adverse impact on the needs of developing countries. The issue requires careful study to determine approaches which might be of greatest value. The appeal of education, training, and salaries in Western countries is not likely to diminish in the near future. A total reorientation of overseas professional education may be required before the drain is effectively modified.

C. Social and Cultural Barriers

Problem: The rate of progress towards modernization goals will be constrained by valuations which permit inhibiting attitudes such as inefficiency, indifference, lack of cooperation.

No listing of obstacles to modernization should exclude beliefs and attitudes. Values are inherent in the nature of man himself. These valuations are recognized to be controlling influences on the rates of technical change or modernization. We undertake studies on "knowledge, attitudes and practices" and admit that "cultural barriers" frustrate expected rates of change. In practice, development planning by governments or donor agencies focuses almost exclusively on improvements in scientific technology and methodology without directly addressing the attitude-belief-valuation patterns of the society that desires the benefits of modernization.

Transfer of the technology of "modern" nations without also transferring or transmitting the historical human values which have accompanied modernization has been likened to the transference of cut flowers. The roots that produced mod rnization in the West may not be accepted, or insufficiently accepted, in those nations which seek the fruits of modernization.

Nehru, Gandhi, and many national leaders have recognized the difficulty of stimulating national growth, achieving social and political equalization, and consolidating a country as a cohesive unit. Nehru wrote: "But we have to deal with age-old practices, ways of thought, ways of action. We have got to get out of many of these traditional ways of thinking, traditional ways of action, traditional ways of production . . . . . distribution, and . . . . . consumption."[38]

Recognizing all the imperfections and conflict in Western society, progress has tended to favor those groups who practice concepts of efficiency, diligence, honesty, integrity, self-reliance, cooperativeness. Western nations incorporate these concepts in public administration, business, industry, and exercise surveillance to assure compliance. These values, nevertheless, could not be sustained were there not some concensus of persuasion among the people of a nation, independent of government structure, that these values are worthwhile.

Respect for the opinions, thoughts and beliefs of other individuals in a free society precludes official government action to induce change. But, at least in the "modern societies", strong historical precedents for social organization outside of government perpetuate beliefs and attitudes from generation to generation which, by their nature, provide a value system which is favorable to technical progress.

The investment in agriculture overseas is enormous. What is the investment in honesty? How does investment in public administration and industrial development compare with investment in diligence and integrity?

Whether or not it is the appropriate role of government or of donor agencies to undertake the role of change agent in 'e valuation area, it is important to recognize that where the modernization process, in any sector is impeded by inefficiency, indifference, corruption, and failure of cooperativeness, solutions may depend ultimately on the impact of value change.

With full recognition of the need to respect the sovereignty and rights of developing peoples to make their own judgements on sensitive issues such as individual beliefs and attitudes, the forces for modernization (internal or external) can approach the problem partially at least by two ways which may be acceptable to governments:

1) through the normal educational process where new generations may be conditioned to requisite values which are acceptable to governments themselves;

2) through the introduction of modernization measures at a point which a developing people themselves understand. For example, in the whole area of physical and mental well-being, the acceptance of preventive health measures initially requires some tangible expression on the part of change agents that there is a legitimate and genuine concern for the welfare of individuals. Regardless of convictions

of key government leadership, the mass of people who are without any form of health assistance may be skeptical of those who profess to seek health improvement but are unable to respond even minimally to the events of sickness, not as a morbidity statistic, but as a phenomenon which is associated universally with anxiety, suffering, and despair. The failure to accept this elementary point may be responsible, to a large extent, for the adverse image created by assistance programs which appear to be unconcerned with man's immediate predicament in favor of long-range benefits.

The accusation of genocide, regardless of its basis in misinformation, particularly in the African setting, is not an easy public relations problem to counteract whenever a government makes known to its own people that external assistance is available for family limitation but not for family protection against high levels of sickness. The issue is not one of diversion of funds which are inadequate even for the urgent task of family planning. Rather, the issue is whether the very large mass of those who most need assistance in family planning perceive that the program is being urged in order to improve well-being rather than to limit population in the absence of an equal concern to protect the health of existing populations.

D. The Research Gap

The foregoing statements of key problems describe the principal area of research need. The problems, being overseas, are not always matched by the research institutional capability to tackle problem areas. While such capability is increasing through exchange of investigators, training in developed countries, and establishment of cooperating research centers overseas, such as the International Center for Medical Research and Training program, the expertise in basic research in developing countries remains very limited.

For a long time, basic research in technological methods — new vaccines, drugs, contraceptives, food additives, improvement in environmental engineering — will be needed from the more advanced research institutions in developed countries. A similar problem applies to the development of new alternative insecticides and chemicals which affect the external environment. Field testing, however, can be carried out within developing countries.

In the area of public health administration, the research methodology for new patterns of health care, manpower training and usage, can call on the experience of government and university resources in Western countries. The distinctive problems of delivering care under the prevailing economic, social and political conditions of the developing countries are a challenge which, because of their relative unfamiliarity to Western investigators, will require close collaboration between basic problem solving expertise in the West and social, behavioural and health administrative experience and expertise in the developing world.

In the field of health planning, the study of the health/economics relationships is wholly inadequate and will deserve major attention if the concept is to prevail that health planning cannot be conceived apart from the total problem of national socio-economic planning.

VI. A FOCUS FOR ACTION

Identification of key problems, regardless of the grouping pattern, is not intended to indicate functional separability. An inseparable relationship exists between pervasive disease patterns, rapid population growth, malnutrition, absence of service delivery systems, shortage of manpower, absence of planning capability, and continuing traditional attitudes.

Family planning cannot succeed if there is an inadequate delivery system through which services can be provided. Malnutrition cannot be overcome by nutritious foods as long as infection compromises the retention of food energy and especially protein. Poor nations cannot currently afford to provide health manpower in separate distinct national systems for family planning, nutrition, maternal and child care.

Common to all the major problem groupings, three key problem components permit a focus for study and action:

1. Inaccessibility or absence of an effective delivery system through which services for family planning, malnutrition, and disease reduction can be made available to more than a small proportion of the population.

Rationale for Problem Selection:

On the average, less than 10 percent of populations in developing countries have ready access to personal health care. The corollary is that up to 90 percent of developing populations are without an effective system through which family planning, nutrition, or general health services can be delivered.

Resolution of this problem through innovative but elementary health delivery systems is mutually supportive of family planning goals and of nutrition objectives which require identification of and contact with the malnourished mother and child.

2. The limited capability for problem perception, analysis, and planning at the cooperating country level particularly with respect to the waste of national public and private resources on preventable illness and excess childbearing.

Rationale for Problem Selection:

The 40 A.I.D.-assisted countries themselves possess greater resources for health (an estimated $10 billion in public and private funds) than can be provided by donor nations. These resources are now applied with great inefficiency, first because of limited national problem identification and planning capability, and secondly, because the net effect of curative medical programs, in contrast to preventive programs, on national welfare is minor.

Careful analysis and wise redirection of national health resources is a prime measure for improving the quality of living.

3. The inefficient utilization of food energy.

Rationale for Problem Selection:

In the current emphasis on the food/mouth relationship, and the emphasis on food production, ingested food energy is seriously wasted in two ways:

a. The failure of the intestines to absorb food efficiently (tropical malabsorption) as a result of food preparation and ingestion within an unsanitary environment.

b. The effect of fever to accelerate protein and caloric energy metabolism. This effect produces secondary malnutrition, particularly in children. Energy losses equivalent to 7500 tons of rice/million population/month are not uncharacteristic of more traditional developing societies.

These problems compromise the effort of agricultural food production by significant waste and create a major drag on nutritional improvement. Efforts to solve food energy losses is mutually supportive of parallel Agency and LDC goals to improve food production and nutrition. Secondarily, as the major cause of death among young children, intestinal diseases form a serious bottleneck to effective family planning efforts since parents cannot be guaranteed survival of their children.

VII. SUMMARY

The primary intent of the key problem identification exercise is to permit the Technical Assistance Bureau to concentrate resources on those problems which most significantly impede achievement of the modernization objectives of A.I.D.-assisted countries.

The focus is clearly on problem identification as a first step, rather than on possible solutions or programs. Resources for problem-solving can be applied rationally only when there is reasonable consensus on the nature of key problems.

The existence of a problem implies an objective. In particular differentiation between a problem and a "key" problem assumes a common understanding of the key goals being pursued.

It follows that "key problems" impeding modernization require reference to some common concept of modernization. If the concept of modernization differs significantly within the Agency, or if development goals are imprecise, the definition of a key problem becomes tenuous. Without a common understanding of goals, there is no common frame of reference against which to assess the degree to which a sectoral problem in agriculture, education, or health may in fact constitute a barrier to modernization process.

The attached analysis does not seek to address "health goals" in the traditional sense, but rather to identify key health-related barriers to a defined concept of the modernization process.

A Common Definition of Modernization

Drawing from Agency and developing country goals, and from Gunnar Myrdal's ten year study of modernization values as seen by developing countries themselves, the salient components of modernization would include the following:

1. The achievement and preservation of national independence

2. National consolidation

3. The application of political democracy in the sense of seeking national consensus

4. The application of scientific reason and analysis to development planning in all key sectors, for example, agriculture, industry, mining, power, transportation, education, and health

5. The rise in productivity

6. The rise in levels of living which includes improved health, education, food, clothing, housing, information, and transportation as the tangible evidence of modernization

7. Social and economic equalization or sharing

8. Improved institutions and attitudes to support change, and

9. Social discipline to accept the price and effort required for achievement of change.

Fundamental to this frame of reference is the underlying notion that it will lead to an improvement in the quality of life. Dr. Hannah, on numerous occasions, has stressed that economic growth is meaningless if it does not improve the quality of human lives.

If the intent is to achieve increased well-being, not only for a few, but throughout the people of developing nations, it is also relevant to note that there is no automatic process by which increased productivity yields an increase in the levels of living. Yet to fail to make the transition is to defeat the intent of modernization.

The Pearson Commission provides recent confirmation that some of the greatest conflicts arising from the modernization process stem from a demand that there be equitable sharing of the benefits of progress.

If improved human welfare is the desired outcome of development, the quality of that effect will be dependent on the removal or reduction of principal barriers which obstruct the progress of multiple and mutually interdependent growth factors. Developing countries face problems in all key sectors and not just in a few. Social and political demands for participation and sharing must evolve parallel to efforts directed toward production of income.

The need to conserve resources and establish action priorities is fully recognized. The initial problem often is the inadequacy of analysis in principal development sectors, among which health is one. Issues of human quality are often not perceived, or they are overlooked because the planning and decision process is based on limited analysis.

The Meaning of Well-Being

If modernization is a process which seeks to improve man's welfare or his well-being, what is the relationship to the concepts of disease and health? The two following definitions illustrate the health/development relationship.

A. A Definition of Disease

Disease, an imprecise term, denotes the state of man's inability to adapt to his own internal or external environment, physical or psychological.

Death is an infrequent occurrence (10-40/1000 population/year) compared to disease (500-900/1000 population/year) which seriously compromises the productive capability of large segments of developing countries.

Man's adaptability and survival in his environment may be greatly increased by any factor which improves his resistance or knowledge to resist--for example, food availability, transportation, housing, education, mass media.

A study of population growth rates shows that the rapid rise of population over the past 350 years evolved prior to the application of a very limited number of mass health campaigns during the post-World War II period. Since no more than 10 percent of populations in developing countries, on the average, have ready access to any form of Western health care, the phenomenal population growth can best be described as a composite of many development factors, among which food availability, improved transportation, increased knowledge, and internal security have played key roles in death reduction.

Non-medical factors have greatly reduced death rates without an equal impact on distribution of disease or the quality of life itself. To survive starvation is not the same thing as improving the quality of the living.

B. A Definition of Health

Health is not a term synonymous with death control. Defined as a development activity, health is that sector of the modernization process which assists man himself to make the maximum physical and psychological adjustment to his internal or external environment, consistent with available resources. The World Health Organization defines health as a state of ". . . . physical, mental, and social well-being and not merely the absence of disease or infirmity."

This positive definition of well-being, in a very real sense, is the ultimate objective of modernization. It refers to the quality of man himself.

Disease prevention, human reproduction family planning, nutrition, environmental sanitation, mental health, and their supporting elements of planning, administration, training, research, communications are key components of the health field.

Health is primarily a social phenomenon which requires the correction of adverse social factors which perpetuate or accentuate maladjustment in the environment. Poverty, rapid population growth, lack of education, insecurity, food shortage--all profoundly affect man's well-being.

A multidisciplinary approach to health achievement is essential. It does not follow that modification in population quantity will automatically lead to improved population quality.

The production of a ton of grain by itself is no guarantee of improved quality of life for the man that produced the grain.

Responsible application of health programming proceeds where it is recognized that an improved level of health is a key supporting factor for sustained growth in productivity and that the two processes are matters of balance rather than of all-or-none priority.

Key Health Obstacles to Development

Key health obstacles to development may be grouped in eight general clusters:

1. Problems related to the high burden of disease
2. Problems related to rapid population growth
3. Problems of malnutrition
4. Problems of environmental pollution
5. Problems of instruments
6. Problems of manpower
7. Problems of social and cultural barriers
8. Problems of research.

Classification of these problems, regardless of the grouping pattern, is not intended to indicate functional separability of key problems. An inseparable relationship exists between pervasive disease patterns, rapid population growth, malnutrition, absence of service delivery systems, shortage of manpower, absence of planning capability, and continuing traditional attitudes.

Can family planning succeed if there is a completely inadequate delivery system through which services can be provided? Can malnutrition be overcome by nutritious foods as long as infection compromises the retention of protein? Can poor nations afford to provide health manpower in separate distinct national systems for family planning, nutrition, maternal and child care?

We suggest three key problem components, common to all the major problem groupings, be singled out for priority Agency attention.

1. Inaccessibility of absence of an effective delivery system through which services for family planning, malnutrition, and disease reduction can be made available to more than a small portion of the population.

Rationale for Problem Selection:

On the average, less than 10 percent of populations in developing countries have ready access to personal health care. The corollary is that up to 90 percent of developing populations are without an effective system through which family planning, nutrition, or general health services can be delivered.

Resolution of this problem through innovative but elementary health delivery systems is mutually supportive of family planning goals and of nutrition objectives which require identification of and contact with the malnourished mother and child.

2. The limited preparation for key problem perception, analysis, and planning at the cooperating country level particularly with respect to the waste of national public and private resources on preventable illness and excess child bearing.

Rationale for Problem Selection:

The 40 A.I.D.-assisted countries themselves possess greater resources for health (an estimated $10 billion in public and private funds) than can be provided by donor nations. These resources are applied with great inefficiency, first because of limited national problem identification and planning capability, and secondly, because the net effect of curative medical programs, in contrast to preventive programs, on national welfare is minor.

Careful analysis and wise redirection of national health resources is a prime measure for improving the quality of living.

3. The inefficient utilization of food energy.

Rationale for Problem Selection:

In the current emphasis on the food/mouth relationship, and the emphasis on food production, ingested food energy is seriously wasted in two ways:

a. The failure of the intestines to absorb food efficiently (tropical malabsorption) as a result of food preparation and ingestion within an unsanitary environment.

b. The effect of fever to accelerate protein and caloric energy metabolism. This effect produces secondary malnutrition, particularly in children. Energy losses equivalent to 7500 tons of rice/million population/month are not uncharacteristic of the more traditional developing societies.

These problems compromise the effort of agricultural food production by significant waste and create a major drag on nutritional improvement. Efforts to solve food energy losses is mutually supportive of parallel Agency and developing country goals to improve food production and nutrition. Secondarily, as the major cause of death among young children, intestinal diseases form a serious bottleneck to effective family planning efforts since parents cannot be guaranteed survival of their children.

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