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9. ABSTRACT
 This report on health in Tanzania discusses national policies impacting on the health sector, the health problems, the health care delivery system, access to health services, self reliance, quality of care, and recommendations. The government has made considerable investment in staffing the health care system with non-physician practitioners. The quality of education being provided is excellent. The curriculum structure may be somewhat inefficient to the extent that it is patterned after that of a school of medicine rather than specifically designed to meet the training requirements for such practitioners. The number of practitioners providing direct patient care that will be produced in the next five years will significantly improve access to care, however, the burden of recurrent expenditures will also be increased. The lack of current plans for the development of a support system for these practitioners suggests that their proficiency will decrease, and that the quality of the services they provide will decline over time. Even though these practitioners are dealing with a limited number of clinical problems, the lack of incentives for continued learning, the absence of adequate supervision, and deficits in the maintenance of the facilities and resources necessary for practice, constitute major threats to the maintenance of an acceptable level of quality of care. The decentralization of governmental functions has created problems related to the coordination of central government functions with those at the district and regional levels. In examining the organization chart for health services in Tanzania, the lines of authority and responsibility are not clear. Decentralization has placed a major burden, in terms of the planning and operation of health services, on the district medical officer. Rising costs of health services are a major concern.

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CONSULTANT REPORT ON THE
HEALTH SECTOR OF TANZANIA

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Introduction

This report is based upon information derived from several sources, including published data describing the health status of the population of Tanzania and the operation of the health care system of that country. Additional information was obtained in a series of interviews conducted with representatives of the Government and others in Tanzania during the period of September 9 through September 22, 1976. These data are supplemented by an analysis of the opinions expressed in these interviews and field visits to a variety of health services settings.

Throughout the report I shall endeavor to distinguish between the objective, or matter-of-record content, and the subjective, or interpretative elements. It must be emphasized that the latter are based upon a series of brief and non-random experiences. It would be presumptive to assume that an outsider could, in a relatively short period of time, hope to appreciate all of the unique cultural factors affecting the operation of a system concerned with providing services as unique and personal as those concerned with health. However, I am comforted by the fact that, with only two or three exceptions, all of the conclusions drawn by me with reference to problems or potential problems within the health sector already were appreciated by one or more of those interviewed.

In reviewing the subjective content, I shall endeavor to distinguish between those areas or items where there was a consensus of opinion, versus those in which the views of those interviewed were clearly divided.

This report is organized into the following sections:

- I. A review and discussion of national policies impacting on the health sector.
- II. The health problems of Tanzania.
- III. The health care delivery system of Tanzania.
- IV. Special areas of concern: Access to Health Services, Self-Reliance, and Quality of Care.
- V. Summary and Recommendations.

I. The Relationship of National Policy to Health Policy in Tanzania

In Tanzania there is complete congruence between the larger set of goals relating to national policy and the subset referable to programs within the health sector. Many of the objectives set forth in the Arusha Declaration of 1967 concern the principal determinants of the health status of the people of Tanzania. These include improvement in economic status, the provision of universal primary education and water supplies for all communities/villages, enhancing the prevailing and traditional sense of self-reliance of the African peoples, and free access to health services.

These policies are especially relevant (and in the order listed) in a Country with the social and economic characteristics of Tanzania. Within this nation of approximate 15 million people, the vast majority (over 90%) of individuals live in rural areas. Most villagers have no access to safe and reliable water supplies, facilities for sanitary disposal of human excreta, or educational and scientific medical care resources. Transportation services

are limited. Due to the interaction of several factors, primarily related to poverty, and secondarily to geographic circumstances, the people bear an enormous burden of disease and suffering. A long history of colonial rule prior to independence in 1961, left the nation with few of the basic resources necessary to improve the health status of its people.

Since that time, the policies of the Government have been extremely appropriate, given the knowledge of the interrelations among factors influencing the health of the people and the health of the economy. While there are long-standing arguments (usually posed by health professionals) regarding the degree to which health services diminish the level of disease and disability, and thus increase the productivity of a society, the majority of evidence suggests that improved health is a byproduct of the elimination of poverty. There are no cases (known to me) where poverty has been "healed" or responded to treatment from curative health services. Thus, the established policies of Tanzania by concentrating primarily on rural development and the improvement of the socio-economic status of the population, should provide in the long run the solution to many of the health problems afflicting the people. However, in the interim, a large proportion of the people will remain sick and disabled, and need and want curative health services.

The fundamental dilemma facing those who must implement policy is to strike a balance between meeting the immediate needs of people for relief from suffering and disease and long term investment in other sectors (rural development, water supplies, etc.). The former requires investment in recurrent costs for expensive and palliative curative health services that have only short-term effects, while the latter provides the only means of curing the health problems of the people. This decision-making is all the more difficult since

It must be done with a recognition of the constraints on economic resources available for all sectors.

Specific Health Policies

The Government of Tanzania has established specific policies within the health sector that reflect an awareness of the dilemma discussed. For example, there has been an increasing emphasis on prevention with a significant increase in that proportion of the budget of the Ministry of Health allocated to preventive services. The medical school in Dar es Salaam has been organized to emphasize community medicine with a realization that the Country's needs for physicians prepared to supervise and provide back-up services to a cadre of other health professionals exceeds that for sub-specialists to provide care in the National consultant hospitals. Perhaps the most important example of the rationality of Tanzanian health policies is the development of a health care system that is based upon utilization of non-physician manpower. In the development of vertical "ladders" of health practitioners, ranging from maternal and child care health aides through assistant medical officers, there has been recognition that such individuals can be prepared to provide care in a shorter period of time than physicians, thus requiring less investment of resources. They also may be more likely to feel comfortable practicing in rural areas. The nature of the pattern of disease in Tanzania, i.e., the fact a few problems constitute the vast majority of all those presented for care, facilitates the development of curricula for the training of non-physician manpower.

The policies for the health sector are logical and appropriate, given the resources available, and the nature of the health problems present. I can express only admiration for the Government and the Ministry with regard to the clarity of their formulation, and their relevance. However, while the individual objectives of these programs and the methods for their implementation are very rational, there are interactions among them that have certain long-term implications that require consideration. The discussion that follows is designed to review these implications. This review consists of an analysis of published data, information elicited in interviews and field visits, formulated in terms of the intermediate and long-term consequences of existing operations in the health sector. They are offered, not in criticism of the objectives of these programs, but merely as a guide for consideration of the interactive effects of programs, and the possible alternatives or trade-offs in programs that may be necessary to achieve specified long-term goals.

II. The Health Problems of Tanzania

The population of Tanzania, based on the 1967 Census (which will be repeated in 1977) was 13.2 million. The rate of growth has been estimated to be 2.8% per year, thus the 1976 population should be approximately 15.0 million. Ninety-five percent of the population live outside urban areas; 44% of the inhabitants are less than 15 years of age, and 21% are females of childbearing age. Thus, 65% of the population of Tanzania are either children or women of reproductive age.

The infant mortality rate has been estimated as 160 per 1000 live births, and the mortality rate for children under 5 as 90 per 1000. The current birth rate has been estimated to be 47 per 1000, and about 1 of 8 (approximately 80,000 of a total of 650,000) obstetrical deliveries per year occur in institutions--bedded dispensaries, rural health centers, or hospitals. The maternal mortality rate in these institutions is 2.5 per 1000 births. Estimates have suggested that the average number of years of life that may be expected by those born in Tanzania is 41 years.

The statistics cited are estimates, since there is no required reporting of vital statistics such as births and deaths in Tanzania. In reviewing the functions of Planning and Analysis Section within the Ministry of Health, the designated agency for receipt and summarization of health statistics in Tanzania, it is apparent that this effort is both understaffed and severely hampered by the quantity and quality of the data it receives. The latter problem raises the question of the reliability of most statistics, except for those related to numbers of admissions and deaths in hospitals. More specific discussion of the problems of management of the health sector, in the absence of adequate information on health status, utilization, and expenditure, will be presented in Section V of the report.

Most of the statistical data on the health status of various groups has been published in the medical literature. However, a report by Hennin and Hegro, based on the 1967 Census,¹ as displayed in Table 1, provides

¹ The 1967 census in Tanzania--A Demographic analysis of Dar es Salaam, Research Paper 19, University of Dar es Salaam

evidence that the effects of educational status on mortality known to exist elsewhere in the world, are operant in Tanzania.

A recent publication from the Planning and Analysis Section (June 26, 1976) summarizes the most common causes of mortality and morbidity in Tanzania during the period 1971-1974. These are presented in Tables 2, 3, and 4.

The most common cause of death is pneumonia. In all probability, many of these deaths represent complications of measles. Admissions to hospitals reflect, in addition to the obstetrical services provided, the impact of malaria as a chronic source of morbidity, as well as those conditions previously listed among the most frequent causes of death. A review of Table 2 reveals that 9 conditions cause almost two-third (65.2%) of the reported deaths in Tanzania. Twelve conditions account for a similar proportion (63.8%) of all individuals admitted to government hospitals. As illustrated in Table 4, 11 conditions are responsible for over one-half (52%) of all of the visits made to hospitals, clinics, rural health centers, and dispensaries. The data in Tables 2, 3, and 4 also are consistent with those reported from village or rural health studies such as that conducted by Nhonoli and Kilama.²

The Prevention/Treatment of Specific Diseases/Conditions

Pneumonia

The principal cause of death, pneumonia, is susceptible to

²Nhonoli, A.M., and Kilama, F.E. A Health Survey of a Rural Population in Mid-eastern Tanzania. East African Medical Journal, 51:122-130, 1974.

aggressive treatment with antibiotics. The consensus of opinion among physicians interviewed who were providing care in Tanzania (as well as in studies published in the literature) is that the high death rate reflects the poor nutritional status of many patients. In some instances these deaths occur among those who have been inadequately treated with one or two injections of procaine penicillin and subsequently develop lung abscesses. Several physicians suggested that bacterial organisms resistant to penicillin are emerging.¹ They indicated that some individuals with pneumonia do not respond as rapidly to penicillin therapy as before, and require the addition of other antibiotics, such as chloramphenicol, to the treatment regimen.

Measles

Measles is preventable with the use of a live virus vaccine. However, there are several logistical problems associated with the distribution and use of this particular vaccine. The vaccine is relative unstable and quite sensitive to fluctuations in temperature. While the biological agent in current use in Tanzania is a more recent development from the original Edmunson B strain, decay in potency at storage in excess of 10°C. is still a major problem.

The current opinion of pediatric experts in infectious disease is that the vaccine should be administered on two occasions, in order to provide optimal protection.² Because of the high risk of mortality among infants, the first dose should be administered at approximately 6 months of age.

¹In 1975 an estimated 8,491,665 grams of penicillin were dispensed through Government-supported facilities.

²The current campaign in Tanzania employs one injection of vaccine at a cost of 1.50 shillings per dose.

However, at this age a considerable number of infants will have residual maternal antibody due to placental transfer, and this inhibits full immunological response. Therefore, a second injection of the vaccine is recommended at approximately one year of age.

The original estimates of the population coverage necessary to reduce the propagation of epidemics were based upon relatively constant and low contact rates. In circumstances that exist in Tanzania, large extended families, and an increase contact rate associated with villagization-coverage required to eliminate epidemics may be in excess of 80%. In a report of a vaccination program conducted in the Mombasa district in Kenya, Lima¹ suggests that complete eradication of measles by immunization is not possible because the vaccine has a limited efficacy of 95%. This article also emphasized that vaccination should be accomplished by 6 months of age.

In a discussion of the biology of measles in African children, Scheifele² points out the enormous variations in the clinical response to infections with this virus that occurs within families. There is no tendency towards variation in virulence of the virus in the wild state; therefore these differences in response must be due to variations in host resistance. In their studies, patients with the severe form of measles have been invariably significantly malnourished. However, the relationship between severity of the disease and the degree of malnutrition does not

¹Lima J.T., Three Years of Measles Vaccinations in the Mombasa District. East African Medical Journal, 52:70-75, 1975.

²Scheifele, D.W., and Forbes, C.E., The Biology of Measles in African Children, East African Medicine Journal, 50:169-173, 1973

seem to be a simple one. Children with the severe form have impaired lymphocytic functions and cellular immunological activities but are not deficient in the production of serum antibodies. They suggest that in the light of present information, and the difficulty in handling the available vaccine, countries should concentrate on improving the general health of children and their nutrition. They cite a study in Guatemala¹ that demonstrated by augmenting the protein intake of village children, mortality due to measles was reduced by 66%.

Gastroenteritis

The drinking of contaminated water is the principal etiologic factor. It is preventable with any degree of efficacy only through the development of adequate and safe water supplies. To some extent there may be a need to modify individual habits with regard to the use of water. However, this is probably of lesser importance with respect to water than for nutritional practices, and those related to the disposal of excreta.

Tuberculosis

While tuberculosis is caused by an infection with tubercule bacillus, studies have indicated that variations in the incidence and prevalence of this disease are primarily related to social and environmental circumstances. A study of tuberculosis in the coastal area of Tanzania by Bennema,² reported in 1974, revealed that the number of individuals in the community-at-

¹Studies of Diarrheal Disease in Central America VIII. Measles, Diarrhea, and Nutritional Deficiencies, American Journal of Tropical Medicine and Hygiene, 15:625, 1966.

²Bennema, A., Tuberculosis in the Coastal Area of Tanzania, East African Medical Journal, 51:262-269, 1974.

large, with positive skin tests ranged from 4.5% of those under five to 67.8% of those aged 20-29, rising to a peak of 89.4% of those over 50. Of the 17% of positive reactors whose sputum was examined, tubercle bacilli were found in 1.3%, and 3% had x-ray evidence of tuberculosis. The results of this survey were similar to those from a study conducted in Tanzania in 1958. The importance of dealing with those who fail to continue medical treatment is emphasized, since over one-half of those known to have the disease failed to comply with medical recommendations for care.

In addition to general improvement of socio-economic status, reduction in crowding, malnutrition and general debilitation, vaccination with B.C.G. is advocated as a means of primary prevention. B.C.G. was administered in Tanzania as part of a nation-wide smallpox eradication campaign, and thus there should be a reduction in the incidence of tuberculosis in the future. However, in a discussion of mass vaccination with B.C.G. in Tanzania, Koch,¹ (1973) states that the protective capability of the vaccine must be taken for granted since "an effect may not be demonstrated for another 10 to 20 years." The reasons given for this include the large reservoir of unknown active cases, as well as the problem of completing adequate treatment. The response to B.C.G. vaccination wanes over time, and the question of whether or not re-vaccination should be conducted indiscriminately every 5 to 10 years, if the induced allergy has not be replaced by a naturally induced response to the bacteria, is a good one. However, there is a strong difference of opinion with regard to the question of re-vaccination with B.C.G., and the issue is far from settled.

¹Koch, A., B.C.G., Mass Vaccination in Tanzania, Tuberculin Allergy, Conversion and Waning Rates. East African Medical Journal, 50:537-542, 1973.

Tuberculosis is susceptible to medical treatment. However, organisms resistant to the cheapest and most widely used antibiotics develop readily. The widespread use of streptomycin in the treatment of "routine" bacterial infections predisposes the population to the development of drug resistant organisms.¹ Also the adequate treatment of the disease on an ambulatory basis requires compliance with medical treatment. That is, the continued adherence of individuals to regimens that involve repeated visits for care, and taking medication, even when symptoms have subsided. The problems of non-compliance, as they reduce the efficacy of almost all efforts in the health care system, will be discussed in greater detail later in this section.

Nutritional Deficiencies

The most obvious and serious consequence of poverty is malnutrition. However, the treatment of nutritional deficiencies is not necessarily accomplished by providing necessary food for consumption. In most societies there are beliefs, taboos, or cultural factors that affect the dietary habits of the people. Thus, the adoption or incorporation of new foods into the diet, as well as the improvement of agricultural methods, frequently requires an alteration of the beliefs and behaviors of individuals related to their dietary habits. The effective prevention of nutritional deficiencies, therefore, requires an improvement in the overall economic status of the population, as well as consideration of the socio-cultural barriers to good nutritional practices.

¹ In 1975, an estimated 1,123,000 grams of streptomycin were dispensed by Government-supported facilities.

Malaria

Malaria is endemic in many sections of Tanzania. There have been many studies and analyses of this problem by international experts. The general consensus of opinion is that eradication of the disease in Tanzania is not feasible at this time. The advocated means of dealing with this problem--a common cause of death, and the most common cause of morbidity in Tanzania--is the chemosuppression of parasitism, with particular emphasis placed on high risk groups such as women of childbearing age and children. However, the success of this program (already initiated in Tanzania) requires compliance by members of the target population with a regimen that involves taking chloroquine on a regular, fortnightly basis, even while asymptomatic. There is considerable evidence that non-compliance with medical recommendations is a problem that is world-wide, and not readily susceptible to most techniques of "health education."

Tetanus

There is a high case-fatality rate in tetanus, which can be prevented by one of the most effective immunizations available. The routine administration of tetanus toxoid to individuals who make contact with the health service system, should, within a reasonable period of time, markedly reduce this particular cause of mortality. As indicated in an article by Ayim,¹ who reviewed 34 cases of non-neonatal tetanus seen at the Muhimbili Hospital, the site of entry of tetanus spores is quite varied in

¹Ayim, E. N., Can A Special Unit for the Treatment of Tetanus Be Justified In a Developing Country?, East African Medical Journal, 50:720-726, 1973.

Tanzania, with the majority of cases secondary to septic dermatological lesions or the foot.

Anemia

The principal causes of anemia in Tanzania are described in the report of a survey conducted in the population near Bagamoyo in 1971.¹ While hookworm infection was found to be extremely prevalent, and malaria was endemic in children, most of the anemias of adults were related to iron deficiency as a consequence of nutritional intake. While the prevalence of sickle cell trait in this and other studies has been found to be approximately 20% in Tanzania, sickle cell anemia does not account for a significant proportion of all the deaths recorded under this general rubric. Deaths from anemia can be prevented only by elimination of the causes of decreased circulating red cell mass. This involves the chemo-suppression of malarial parasites, the elimination of hookworm (dependent upon the development of adequate sanitation) and alteration of nutritional patterns coupled with the provision of foodstuffs containing adequate iron content.

With regard to the improvement of sanitation, it has been shown that pit latrines may be dug, and concrete slabs provided to cover them, but these efforts do not insure the use of such latrines by villagers. As with nutrition, there are strong socio-cultural barriers that must be overcome in persuading individuals to alter life-long habits.

¹Vaughn, J. P., et.al., Anemia in a Coastal Area of Tanzania, East African Medical Journal, 50:86-93, 1973.

Factors Related to Prevention-Cure of Illness

Figure 1 illustrates the relations between factors influencing the principal causes of morbidity and mortality in Tanzania. These include efforts to improve the socio-economic status of individuals, improvement of sanitation, and nutrition and the provision of safe water supplies. However, to achieve the maximum benefits from these changes in the environment, it is also necessary to alter the behavior of individuals. This means dealing with existing cultural patterns, beliefs, and habits. Perhaps the only diseases that are immediately susceptible to primary prevention, without attention to the health-related beliefs and behaviors of the people, are tetanus, and to a lesser degree, measles.

Until primary prevention is accomplished with greater efficacy than is possible at present, the major causes of mortality and morbidity reflected in Tables 2 through 4 will not change. The Figure demonstrates the soundness of policies of the Government. It also, however, illustrates the importance of dealing with the socio-cultural variables, i.e., the fundamental beliefs and behaviors of the people as they relate to health practices in Tanzania, if investments in rural development, water supplies, and excreta disposal are to be maximally effective.

The Meaning of Illness in Tanzanian Society

While there are over 120 tribes in Tanzania, the policies of the government have been designed to produce a sense of national unity and to develop a more homogeneous population. The practices of allocating secondary school students to schools in other regions, and the frequent

transfer of government personnel seem to be manifestations of an effort to "de-tribalize" a society that is rich in cultural beliefs and practices.

There are only a few published reports of studies by social scientists on the content of these belief systems related to health and illness. These, however, demonstrate evidence of a considerable set of beliefs and customs related to disease and illness in this society. Existing belief systems attribute many of the manifestations of illness to the effects of ghosts, spirits, ancestors, or witchcraft. Thus an individual who becomes ill seeks care not so much to find out what the problem is, but to discover who has caused it. There is an indigenous system of traditional medicine that represents a cultural response or a means of coping with the burden of disease that exists in the population.

It is highly probable that the "sick role" in Tanzanian society, i.e., the expectations and obligations related to being ill, is more demanding than for individuals in western societies. In the latter group, the sick person is exempted from social responsibilities in exchange for the expectancy that he/she will seek help from competent sources. Persons are held relatively blameless for their conditions. However, there is an element of "guilt" associated with being ill in African society.¹ While scientific medicine may provide treatment for disease, it does not provide a means of being absolved or relieved of the guilt associated with acquiring that illness, a service which is provided only by some traditional practitioners.

¹Claxton, M., The Sick Person in Ugandan Society, African Journal of Medical Science, 3:471-478, 1973.

Illness Behavior

While the sick role may be somewhat more complex in Tanzanian society, the problems of illness behavior--those behaviors undertaken by a person who feels ill for the purposes of defining the cause of his illness, and in seeking treatment--seem, on the basis of data from published studies, interviews, and observations, to be quite similar to those known to exist in the United States and Western Europe. These problems are three in number: 1) failure to seek help when faced with serious symptoms of illness (delay or avoidance of seeking care), 2) non-compliance with medical treatment--a failure to follow recommendations for treatment, including taking medication, alterations of diet, or styles of life, and 3) the relative over-use of services for non-medical conditions. In most developed nations, a small proportion of individuals without significant medical diseases account for a significant proportion of all encounters with the health care systems. These individuals have been given a variety of titles, including the "worried-well." While they do not have problems that are medical in nature, they have many social problems for which they seek attention, and also exemption from their social responsibilities.

There are few published studies of any aspect of illness behavior in Tanzania. However, there was general consensus among all practitioners interviewed that non-compliance was a problem in Tanzania. That is, individuals who are expected to take pills for several days stop their medication after 2 or 3 days, usually when the symptoms abate. There are two or three studies of the treatment of chronic diseases, such as leprosy¹ or tuberculosis, that

¹Hertroijs, R. R., A Study of Some Factors Affecting the Attendance of Patients in a Leprosy Control Scheme. International Journal of Leprosy, 42:419-427, 1974.

indicate that failure to return for treatment and non-compliance with medical recommendations is a major problem in the treatment of such patients.

The question of overuse of services in a population with a high prevalence and incidence of serious disease might seem to be absurd. However, the circumstances that are propitious for the occurrence of over-utilization in any system are present in Tanzania. 1) the availability of services (to those who can reach them) without any economic deterrents, i.e., free care, 2) a high level of stress, and 3) the knowledge that exemption from social responsibilities or achievement of certain personal objectives, such as job transfers, can be facilitated by a statement from a health professional.

The opinions provided by practitioners interviewed about this matter were not unanimous. The majority felt that there were, known to them, a small number of individuals who came very frequently for medical attention. These individuals were more readily identified in hospitals or health centers where records or cards were kept, noting the nature of each visit. Thus, there was an opportunity to observe that some patients had "many cards." These individuals were characterized by practitioners as persons who lived near the health center or facility. Beyond that, there was very little agreement among those interviewed about other characteristics they held in common. It was suggested by them that this phenomenon (overuse) was more common during periods when individuals had money to pay for health services, and that during those intervals they often went to facilities operated by voluntary agencies, where they paid for services.

Impressions of those interviewed are consistent with the data reported in one published study that has investigated this phenomena in Tanzania.¹

¹Holmes, J.A., and Speight, A.N., The Problem of Non-Organic Illness in Tanzanian Urban Medical Practice, East African Medical Journal, 52:225-236, 1975.

One hundred-seventy consecutive patients coming to the new patient Medical Clinic at the Muhimbili Hospital from November 1971 to 1972 were studied with regard to the problems they presented. The majority of patients seen in this clinic are sent from outlying dispensaries, or by private practitioners or specialists. Patients were worked-up by fourth or fifth year medical students and then seen by one of the authors. They were subsequently classified as either having organic disease or non-organic diseases. The former category included anyone who was found to have physical or biomedical problems, even if they also had psychiatric symptoms. Only if there was no structural disease relevant to presenting symptoms and there was positive evidence of psycho-social problems, were patients placed in the second category. Forty-eight percent of those in the study were classified as having organic illness, 48% as non-organic, and in 4% the classification was in doubt. A slightly greater proportion of the women had organic illness (51% versus 45%), while the reverse was true for men, with exactly the same proportions.

The characteristics of those who were classified as "non-organic" included the following: 1) they more frequently had histories of symptoms that exceeded one year in duration; 2) the average number of visits to outpatient clinics prior to coming to the hospital was higher (31 versus 8 visits for those with organic medical problems); 3) the referring diagnosis, when it existed, was far more relevant among those with organic-based symptoms (42% versus 9%); 4) 62% of these patients were between the ages of 15 and 29 years of age, 32% of those with organic problems were in the same age group; 5) the majority of these patients were employed in clerical or skilled laboring jobs, while only 10% were farmers. (This is undoubtedly a factor

influenced by the location of the hospital in Dar es Salaam).

The most frequent complaints of individuals without organic disease were abdominal pains (28%), palpitations of the heart (19%), vague or generalized pains (18%), and total body weakness (15%). In contrast, these symptoms were infrequently found in those with organic-based complaints. Thus, 90% of the patients with chest pain, 75% of those with abdominal pain, and 70% of the patients with palpitations were thought not to have organic disease.

The limitations of this study, as related to the nature of the hospital where these patients were seen, were recognized. It was suggested that dispensaries in rural areas might have fewer of these types of patients. However, Giel and Van Luijk in Ethiopia found an equally high prevalence of psychiatric complaints, both at the Addis Ababa General Hospital and a rural health center.¹

A consistent background theme seen in these patients was the passage from rural to urban life, with disruption of traditional modes of dealing with illness. They suggest the following problem areas seemed particularly relevant: 1) the competitive school system, with parental pressure on students to succeed, 2) personal financial insecurity with enormous pressures on wage earners to support a large or extended family, 3) frequent transfer of employees to unfamiliar regions, and 4) excessive fear of illness and its potential severity. Certainly most of these are real problems, and justifiable sources of concern when mortality rates for children under 5 may reach 40% and the average expectancy of life is 41 years.

¹Giel, R., and Van Luijk, J.N., Psychiatric Morbidity in a Small Ethiopian Town. *British Journal of Psychiatric Social Work*, 115:149-155, 1969.

Witchcraft is still widely held to be an important factor in the causation of illness, even among the educated in urban African cities. The authors suggest that in Dar es Salaam there may be as many as one traditional practitioner per 1000 of the population. Most of the patients seen in this study had previously consulted these practitioners. They conclude by emphasizing that anxiety was by far the most common problem found in the mental health field, and quote Lambo¹ as stating, "Anxiety, which is the most common and crippling disorder in Africa, also forms the central core of other neurotic reactions in the African. It is likely that traditional beliefs still influence sickness behavior, even when the overall belief system of the individual has been disrupted."

Stress

Until recently there has been a strong belief in western cultures that the diseases of stress, i.e., peptic ulceration of the intestinal tract and hypertension, were not seen commonly in Africans. Evidence is now appearing in the medical literature, and it was the consensus of practitioners interviewed, that diseases associated with psychological stress were extremely common in Tanzania. As one article² indicates, in a society where there is

¹Lambo, T.A., Magic, Faith, and Healing (Ed.) A. Glencoe Free Press, New York, 1969.

²Corachan, M., Radiological Studies on the Upper Digestive Tract in Tanzanians at Mwanza. Tropical and Geographic Medicine, 28:16-20, 1976.

considerable realistic concern about whether there will be water, firewood, and food to eat on a day-to-day basis, as well as a belief structure in which a variety of spirits and sorcerers may produce death or disease without warning, it should not be surprising to find the consequences of stress.

The Determinants of Health-Related Beliefs and Behavior

Patterns of illness behavior in western society are, to a degree, determined by expectancies held by individuals (their perceptions) regarding their own vulnerability to health problems, the probable severity of an illness, and the benefits of care. On September 20, I had an opportunity to interview, with the help of a Swahili interpreter, five young patients in the Bugando Consultant Hospital, utilizing some of the questions I have used in 3 or 4 other countries in studies of the health-related beliefs and behavior of children. Table 5 summarizes the results of these interviews.

All of these children were hospitalized for significant medical problems. Four of the five children (ages 9 to 15) were either unable to answer a question about how they became ill, or else responded that "disease is in the village," or that "one got bewitched." A 15 years old boy, who lived in the town of Mwanza, and was in the fourth standard at school, suggested that illness was caused by the environment. With regard to their own perceived vulnerability ("Compared to other children your age, do you get sick more often, less often, or about the same?"), three out of five--quite realistically--saw themselves as becoming ill more often. Responses to a question designed to probe the perceived severity of illness in children ("Have you ever been sick and not told?"), evoked a uniform

response. All these children said they always reported when they were ill. Such a response does not permit an assessment of the perceived benefits or disadvantages of medical care.

When asked if they knew anyone who pretended or "played like" they were ill, one child smiled and said, "no"; another indicated that when anyone was sick they were taken to the doctor and proved to be sick. Only the 15 year old boy from the town said that some kids he knew at school pretended to be sick to get out of things that they did not like to do. One child did not perceive food to be important to health, and two out of three children asked if they believed witchcraft could cause illness, said yes.

The responses from this small, non-random sample of children would seem to suggest that, as in other societies, children in Tanzania are engaged in social learning at an early age about the meaning of illness in their society, and the steps to be taken to prevent illness or to become well when sick. The fact that young children demonstrate the beliefs prevalent among adults suggests that, if the next generation of citizens of any nation are to be more susceptible to efforts to prevent disease, increased effort must be made in primary education to prepare these young people to be competent decision-makers with regard to their own health, as well as all other aspects of life as adults.

It seems likely that, as social and economic conditions improve in Tanzania, and as the general level of education rises, utilization of services will increase, and there will be an increasing prevalence of "overuse."

It is not too early to anticipate this phenomenon and to consider methods for dealing with the problems created when a small proportion of individuals, who require different types of services, consume a disproportionate volume of health care resources, thus reducing access to care for others.

III. The Health Care System in Tanzania

The three principal components of the health care system--manpower, organization and financing arrangements, and facilities--will be discussed separately. However, the management of such a system must reflect an awareness of the interdependence among its components. For example, shifts in policy that influence the training of manpower, either in terms of the numbers or the types of practitioners, can have profound effects on the financing of services (costs), as well as requirements for facilities. In this section data will be presented describing each of these components. Subsequently, some of the interrelations between them will be reviewed, and interactions that will affect future operations of the health sector will be discussed.

Manpower

Tanzania is one of the few nations in the world that has designed a program for developing manpower that is consistent with national policies and the resources available for their implementation. The development of a system, based upon the provision of personal health services by non-physicians, is an example of rational and courageous planning. While many nations--both developed and developing--are preparing intermediate level practitioners variously labelled medical auxiliaries, physicians assistants, medical assistants, etc.--most are struggling with traditional views that only physicians are capable of providing primary care services.

The Medical School in Dar es Salaam also has been affected by national health policy. The emphasis placed on training in community medicine is greater than in most medical schools throughout the world. This is reflected in the organizational structure of the school, as well as its curriculum. There has been limitation in the size of the medical school graduating class. Data have been cited, although no formal economic analysis could be found to support them, that the cost of preparing a physician in Tanzania is 250,000 shillings, while the equivalent costs for the production of one medical assistant was 16,000 shillings, and for a rural medical aide, 10,000 shillings. Thus for each physician graduated, 16 medical assistants, or 25 rural medical aides could be produced.

The Medical School has been the subject of a recent report by another consultant. Only a few additional bits of information are provided to supplement that report. There are approximately 300 applicants for the 50 entering positions in the medical school class each year. Of this number about one-half have two "principal passes," a prerequisite for consideration. Because of the Musoma Declaration, future selection is based upon the results of this examination (given upon completing secondary school), as well as reports on the personal achievements of applicants during their national service and work experiences required prior to entering the university. Some additional emphasis in selection is placed upon the applicant's scores on those sections of the test related to "scientific disciplines."

The budget of the Medical School is provided by the Ministry of Education. In 1974-75 it was 8,324,000 shillings. In 1975-76 it was

estimated to be 10,274,000 shillings, and the budget request for 1976-77 will be 12,010,000 shillings. These funds do not include salaries for post-graduate trainees (residents), or the operation of the Muhimbili Hospital. The latter is provided in the budget for hospital services through the Ministry of Health. The annual growth rate of the budget for the faculty of medicine, for the past two years, was 23.4% and 16.9%. These will be compared to overall rates of increase in costs for various operations within the health sector later in Section III.

As indicated in the previous report, there has been some difficulty in maintaining all of the activities planned for the Division of Community Health because of faculty turnover. In 1975 most of the faculty resigned. However, with rigorous recruiting, all but one of the 15 available positions will be filled for this academic year. The majority of these faculty members will be expatriate physicians. The Division will be assisted by a grant from the Milbank Foundation of the United States, which provides stipends for the "topping off" of 12 faculty salaries. Faculty salaries range from 4500 shillings per month for professors to 2500 shillings per month for lecturers. Expatriate physicians receive approximately 50% more and this "topping" is not taxable.

A traditional medicine research has been established in the faculty of medicine. The program plan for this research unit will be executed in three stages. The first stage has begun. This includes surveys and a descriptive analysis of the status of traditional medicine practices in

Tanzania, as well as the collection of herbs used by such practitioners. These herbs are being identified by botanists, and subsequently will be analyzed chemically to determine their active ingredients (if any). In the final stage, clinical trials utilizing some of these herbal medicines will be conducted. The unit, under the direction of Dr. P. A. Katundu, is awaiting housing in the pharmacy block which is now under construction.

The newly elected Dean, Dr. A. M. Nhololi, was the first Dean of the Medical School. He has recently been re-elected, an appointment that requires approval by the President. The Dean's primary objective during the next few years is to increase the number of Tanzanian faculty members so that it approximates 80% of the total faculty. It is now less than 50%.

In discussing the possibility of increased specialization of graduates of the Medical School, the Dean indicated that he believed the system did favor specialization by providing financial incentives for those who chose to return for postgraduate training (in contrast to those who chose to remain as district or regional medical officers). The possibilities of considering family practice as a specialty, or introducing other forms of postgraduate training emphasizing the management of health care programs as a means of providing specialty credentials (and thus financial incentives) was discussed. While family practice has not been considered as a possible addition to the postgraduate training programs, there has been an effort to provide postgraduate programs in public health. This, however, has been hampered to some degree by the shortage of faculty in community health.

Non-Physician Manpower

The provision of health services in Tanzania is dependent upon the operation of a system of training programs to prepare non-physician practitioners. Table 6 summarizes information on 1) the number of training centers for different types of practitioners; 2) the national target or numbers of centers to be constructed for each type; 3) the average class size; and 4) the duration of training. It also provides a 1975 estimate of the then-current number of each type of practitioner in Tanzania. Finally, a projection has been made of the additional numbers of each type of practitioner that will be generated over the five year period from 1975 through 1980, as well as the total number that should be available as of 1980. These estimates include a 5% annual loss from training, since current indications are that over 95% of those who enter these programs graduate and are employed in the health care system.

This table does not detail the training of a variety of other types of manpower, such as pharmacists, pharmacy-assistants, health auxiliaries, hospital secretaries, etc. While these individuals are important to the functioning of the system, Table 6 enumerates only those practitioners who provide direct health care services to the people of Tanzania. They not only constitute a source of recurrent expenditures (salaries), but in the process of providing services, cause the consumption of additional resources such as drugs and medical supplies.

The manpower training programs of Tanzania represent two vertical career ladders. One involves a sequence from rural medical aides to

physicians; the other from maternal-child health aides to nursing supervisors. Individuals prepared as rural medical aides may, after working experience, apply and be admitted to a Medical Assistant training program. Medical assistants who have worked for three years may apply for assistant medical officer school. Assistant medical officers are licensed in Tanzania and are called "doctor." However, should they desire, they may apply to the medical school. It was the consensus of those interviewed that upward career mobility does occur, to the point of conversion from an assistant medical officer to a physician. There were doubts expressed about the extent that assistant medical officers might want to or be able to compete successfully for admission to the School of Medicine.

A separate career ladder exists primarily for female health practitioners. A maternal-child health aide, after 3 years of work experience, may apply for and take the course on community nursing, which lasts one and one-half years, and qualify as a registered nurse-"B." In turn, after 3 years of working experience at this level, she may take the public health nursing course and be certified as a registered nurse-"A."

Selection

Selection is carried out by the Manpower Division of the Ministry of Health. Individuals who complete primary school and secondary school take exams in a variety of subjects. For example, individuals completing Form 4 take exams in English, Swahili, politics, geography, math, general science, biology, physics, chemistry, and agriculture.

They also are asked about their preference for specific types of training programs. Selection for the Medical Assistant program (from among those who express interest) is based upon two "passes," one in either math, general science, biology, physics, or chemistry, and an overall "pass" on the examination. The same criteria are applied for admission to schools of nursing. Individuals selected are assigned by the Ministry to a specific training center. They receive 60 shillings per month plus room and board for the duration of their training.

The selection of rural medical aides also is based upon scores in exams taken on leaving primary school. Scores on a test made up by teachers in schools for rural medical aides are also considered. These students are interviewed at the time they take the special examination.

The initial group of maternal-child health aide students were village midwives, referred to the school by district medical officers. This particular course was only 9 months in length. Thereafter, selection has been based upon a process similar to that described for rural medical aides, also using a special test constructed by the teachers in these programs.

Curriculum

Each of the various training programs has its own curriculum. Three of these outlines were reviewed in some detail, and are the subject of additional comment.

Medical Assistant

Currently there are steps underway to revise the curriculum for medical assistants. Apparently this is based upon an awareness that the program, as outlined, resembles the curriculum for a medical school, only in abbreviated form. The manual reviewed was the Tanganyika Medical Training Board Regulations and Bylaws for Medical Assistants, Revised 1966. The first 8 pages contain statements of the standards and requirements for each training program. The subsequent 77 pages outline the content to be covered. Each of these pages contains from 3 to 24 educational objectives, or an average of 10 per page. The curriculum, as outlined in this document, contains from approximately 650 to 700 objectives. Most of these, as stated, require only recall of information. Some describe required psychomotor skills. A few require more complex cognitive functions, such as "to interpret". . . "to analyze," etc.

Rural Medical Aides

The document reviewed was "The Tanganyika Medical Training Board Regulations and Bylaws for Rural Medical Aides, Revised December 1972.

The initial seven and one-half pages of this document constitute a statement of the standards and requirements for training programs, as well as the regulations that govern their operation. The subsequent 21 pages describe the content of the curriculum in a semi-outline form,

somewhat similar to the outline of a textbook. These statements were not translated into educational objectives.

Maternal and Child Health Aides

The curriculum is composed of 4 units. The first one is entitled, "Personal Family and Community Health," and has 23 objectives. The second is labelled, "Clinic Management," and has 11 objectives. The third focuses on maternal-child health with 5 sub-units, having a total of 53 objectives for learners. The fourth is entitled, "Child Health," and has 16 objectives. Thus, there are a total of 103 educational objectives for this 3-year program. The majority of these are stated in terms of the behaviors expected of learners, and most require complex cognitive functions, such as "analyze," "interpret," etc. Some describe psychomotor skills, and only a few require the recall of factual information.

Impressions

On the basis of visiting one of the Medical Assistant Centers and having the unusual opportunity of conferring with teachers from most of these Centers at the Workshop on Curriculum held at the Kilimanjaro Christian Medical College, the following impressions were gained.

The students admitted to these programs apparently are reasonably well prepared, although there is considerable emphasis in selection on

quantitative cognitive abilities, i.e., test scores, rather than motivations or orientations for human services. The latter, of course, can only be assessed in some form of interpersonal contact between prospective students and a selection committee.

There is an awareness among some of the faculty that the curriculum of some of these programs may be too "didactic." This apparently was the reason for holding the Curriculum Workshop. During my 2 days of attendance at that workshop, considerable discussion focused on sophisticated educational techniques and curriculum innovations which, if adopted, should improve the efficiency of these educational ventures.

The quality of these training programs would seem to be first-rate, and the products, i.e., graduates, perform quite adequately. Over 98% passed their final examinations. There apparently are problems in maintaining a stable faculty because of policies related to the transfer of medical officers. The maintenance of first-rate training programs is, to a large extent, dependent upon the quality of the faculty, not only in terms of their intelligence, but also their motivation for teaching. The development and maintenance of excellence in these programs would be facilitated by some degree of stability of the educational staff. i.e., a low turnover rate for faculty.

Manpower Costs

While manpower training may not be viewed by all as a developmental expenditure, the preparation of practitioners does represent a form of investment in the future. Table 7 contains estimates of prior investments as of 1975 and (based upon the data in Table 6) the estimated "developmental capital" represented by the pool of professional manpower that will exist in Tanzania as of 1980, given the projections by the Ministry of Health. In performing these calculations, the training costs previously cited for physicians, medical assistants, and rural medical aides have been utilized, and the estimate for rural medical aides applied to nurse-B's and maternal-child health aides. The costs of training for medical assistants have been used to calculate investments in assistant medical officers and nurse-A's. No allowances were made for past inflation in these estimates.

While there may be some argument about considering manpower training costs as a form of developmental expenditure, there can be little doubt about the validity of projecting future recurrent expenditures for salaries to sustain the system generated.

The salaries paid to persons providing direct personal services are shown in Table 8. These figures were provided by the Manpower Division of the Ministry of Health. They were applicable during 1975-76.

Table 9 illustrates the annual recurrent costs for salaries for each of these type of practitioners in 1975. Similar projections are made for 1980, in terms of the recurrent costs for employment of manpower that will have been produced by that year. In performing these calculations a series of assumptions were made. For physicians, medical assistants,

nurse-A's and nurse-B's the average salary was calculated to be 20% higher than the minimum salary, reflecting the existence of individuals with some seniority in each of these professional groups. In other words, the average salary per year used in these estimates reflects the minimum for that type of personnel plus 20% of the total increase possible. For the categories of intern, assistant medical officer, senior rural medical assistant, and maternal-child health aide, the minimum salary has been utilized reflecting in one case the one-year nature of the job (intern), the limited range, or the newness of the program.

These calculations were made assuming a 6% increase per year for all categories either for seniority (merit) or cost-of-living increases. No attrition from the ranks of those practicing was anticipated, and these estimates do not include any costs associated with travel, continuing education, drugs prescribed, or supplies consumed.

Other Personnel Providing Medical Care

Rather than review each of the many other types of manpower training programs, additional observations will be limited to two other types of programs, one in existence and one under consideration. Both, however, are (or would be) involved in direct patient care.

Dispensary Aides

Some of the dispensaries in Tanzania currently are staffed by dispensary aides. These individuals do not receive any formal training other than that provided during a 4-week exposure to the activities associated with health care provided in a district hospital.

Apparently a standardized format does not exist for these training programs. Physicians interviewed described it as essentially on-the-job training in which these individuals were given some lectures, attended rounds, and were taught certain dispensing practices. Some physicians involved in these training programs suggested that these individuals, unlike students in other training programs, were not equal in their enthusiasm for learning the functions they were to perform. One physician felt that after 2 weeks of this training, future dispensary aides could be subdivided into those that might really be expected to do a first-rate job in providing symptomatic treatment (50%), those who were totally disinterested, of whom the physicians expected little (25%), and those for whom the prognosis was uncertain (25%).

Village Medical Workers

Quite recently it was proposed to prepare an individual in each village to serve as a village medical worker. These individuals would be trained in first aid and provided a box of supplies with a limited number of pharmaceutical items. On the basis of experience and further training, other materials would be added to their therapeutic armamentarium. It is suggested that these individuals would perform triage, first aid for urgent problems, and serve as an unpaid member of the village, providing services to their fellow villagers.

The Organization and Financing of Health Services

Consistent with the socialist-democratic orientations of the Nation, there recently was a major move toward decentralization of governmental functions. This was accomplished in order to place decision-making power in the hands of the people at the village level. Thus, the planning process for health services now begins at the district level. The budget for a district is developed by the District Developmental Commission and its Director with input, in terms of needs for health services, from the District Medical Officer. These proposed district budgets are forwarded to the Regional Developmental Director who, with the advice and input of the Regional Medical Officer, attempts to balance budgetary requests among the various sectors and districts. However, this seems to be primarily a priority-setting exercise. Finally, the proposed budgets are aggregated in the Prime Minister's office where final decisions are made regarding budgetary allocations. Thus, the key individuals in determining regional health budgets are the District Medical Officers.

The total annual expenditures allotted to the health sector are determined by the Treasury and the Cabinet, and final allocations between national and regional budgets are made at this level, in collaboration with the Ministry of Health.

The organizational arrangements in the health sector are depicted in Figure 2. The Minister of Health is a member of the Cabinet and thus participates in decision-making at the National level. The three major divisions of the Ministry are: manpower, hospital services (curative medical care), and preventive services. However, the Ministry of Health

has no control over the formulation of the district-regional health budgets, and is not provided information on the level of expenditures against various line items in regional budgets during the fiscal year.

Organizational Staffing Patterns

The regionalization plan for Tanzania consists of the following levels of services: A village health post is envisioned, and there has been some discussion of staffing this with a new type of health worker called a village medical worker. Above the village level, the rural dispensary is to be staffed by one rural medical aide, a maternal-child health aide, or a midwife, and is to serve a population of 6000-8000 individuals. The rural health center is planned to have a staff consisting of one medical assistant, two rural medical assistants, one nurse-B, one maternal-child health aide, one laboratory auxiliary, one health auxiliary, and one pharmacy auxiliary. Rural health centers would serve a population of approximately 50,000. District hospitals are to be staffed by physicians and assistant medical officers with essential nursing and ancillary personnel, while regional hospitals will have physicians trained in internal medicine, pediatrics, and obstetrics and gynecology. Three hospitals--Muhimbili, Kilimanjaro, and Bugando--are to serve as consultant referral hospitals for the Nation. At present, due to a variety of circumstances, rural dispensaries may be staffed by dispensary aides, and rural health centers may have only rural medical assistants, but district and regional hospitals do have physicians on their full-time staff.

Costs

Data provided by the Ministry of Health on annual health expenditures are shown in Table 10. There has been an increase of almost 100% from 1973-74 expenditures to those proposed in the Minister's budgetary requests for 1976-77. During this interval the proportion of funds spent on hospital services has decreased in comparison to those provided for preventive services. However, the increase of 240 million shillings over the 3-year period reflects an almost two-fold increase in funds spent for curative services, as well as a four-fold increase in the number of shillings allotted for preventive services.

In the budget of 503 million shilling proposed by the Ministry of Health for 1976-77, 97,732,000 are allocated for development. This represents a 20% increase in this category over the previous year. Of this amount, 58,639,000 are to be provided for National projects and 39,093,000 (approximately 40%) are for regional developmental activities. Over 51% of the National developmental budget is to be spent on additional training activities, and the residual divided almost equally between preventive services and improving the quality of hospital facilities. The regional developmental budget includes 15,000,000 shillings for the completion of 15 rural health centers and 84 rural dispensaries, plus an additional 6,000,000 for the completion of similar facilities started in previous fiscal years.

In addition to the funds spent on the health sector by the Government of Tanzania, data cited by the Minister in his annual budgetary speech indicate that 69,700,000 shillings will be contributed by outside donors.

However, this estimate is somewhat low since the contributions of the People's Republic of China is quoted as being "in kind," and these data do not include A.I.D. contributions. This summary of proposed expenditures for health services in Tanzania in 1976-77, also does not include an estimate of the cost of services provided by voluntary agencies. This will be discussed in more detail later in this section, but the magnitude of this contribution may be placed in perspective by noting that from 40% to 45% of health services in rural areas are provided by the voluntary agencies, and the costs of these services are only partially supported by grants from the National Government.

Relative Increases in Expenditures for Health

Trends in governmental expenditures for health and their associations with other economic indicators in Tanzania are illustrated in Table II. As noted, while the gross domestic product index has increased by a factor of 4.27 from 1961-62 to 1975-76, national governmental recurrent expenditures rose by a factor of 5.38. The trends toward increases in recurrent expenditures have been even more pronounced in the health sector, demonstrating a 700% rise in the same period of time. This growth, however, reflects the transfer of budgets for rural health centers and dispensaries from local to national budgets.

It has been estimated that approximately 75,000,000 shillings were spent on drugs distributed by governmental facilities in 1975-76.¹ Given the rate of increase in the production of manpower, recurrent expenditures for drugs alone should be greater than 200,000,000 shillings in 1980.

¹Dr. John Yudkin, Faculty of Medicine.

The estimate of 1,133,000,000 shillings for national government health expenditures in 1980-81 is based upon an extrapolation of the proportion of recurrent expenditures for salaries from 1975-76 to 1980-81, and further assumes a 6% per year growth inflation of all other costs in the health sector, i.e., drugs, supplies, etc.

Facilities

The policies of the National Government related to health facility construction have been very sound. Confronted with the constraints of limited resources and aware of the significant developmental and recurrent expenditures associated with the construction and staffing of hospital facilities, the Government has elected to proceed cautiously with a program of construction primarily of dispensaries and rural health centers. As of 1976, there are 128 hospitals with a total of 18,400 beds in Tanzania. The bed to population ratio is 1 to 720. These are not distributed optimally, either as a function of the density of population or in a manner so as to minimize the distance traveled to these resources. This is not surprising since almost one-half of these facilities were constructed by voluntary agencies.

The total includes 18 regional hospitals and 105 district hospitals, providing a total of 12,500 beds. At present there are 3 national consultant hospitals, and two more are planned. However, there is no target date for the construction of these two additional consultant hospitals.

The number of rural health centers in operation is not clear. While reports in 1975 showed 150 rural health centers to be in existence, the Minister's speech in July 1976 indicated that only 5 rural health centers were completed during 1975-76 of the 23 due to be completed in 1974-75. He also announced that none of the 26 rural health centers planned for 1975-76 had been completed. Apparently 60 rural health centers are now in some stage of construction, and should be completed during 1976-77. The total number of rural health centers planned by 1980 is given as 300.

Rural dispensaries will be distributed so that no individual is greater than a 10 kilometers walk from such a facility. At present there are approximately 1800 of these, and a target of 2000 has been set for achievement by 1980. In the Minister's budget speech of July 1976, he indicated that in the previous year 123 rural dispensaries were completed, and an additional 132 are now under construction.

There are two specialty hospitals in Tanzania, a long-term psychiatric hospital at Mirembe, which served 2793 patients in 1975, and a tuberculosis hospital at Kibong'oto with 256 beds that had 3850 admissions in 1975.

Facilities planning should be improved by an agreement reached between the Government and the voluntary agencies. In the future all health facilities constructed by voluntary agencies will be located in underserved areas. This collaboration between the agencies and the Ministry should serve the interests of both groups.

The Voluntary Agencies

Data on the role of the voluntary agencies in the provision of health services in Tanzania might well have been included under either of the previous sections on manpower or organization and financing. They are included under the section on facilities primarily because these agencies have been operating hospitals in Tanzania for many decades. Their efforts mainly involve the provision of medical (curative) services, although there have been increasing emphasis on outreach and the provision of preventive services over the past several years. These services are based in hospitals or dispensaries built by contributed funds from the agency and staffed primarily by expatriate physicians.

The fact that the activities in the voluntary sector are facility-based and emphasize curative services has both major benefits as well as some potential disadvantages for the Nation. Certainly these agencies have provided essential services for those afflicted with disease and, as is evident from a review of the available data, they have played a major role in the provision of health services in Tanzania.

In 1974 a conference was held in Dar es Salaam, convened by the Christian Medical Board of Tanzania, to discuss the current and future role of the voluntary sector. A variety of data were provided in the summary of that meeting, which was attended by representatives of the Ministry of Health. These data were based on information available in 1973. More recent data on the calendar year 1975 are available to supplement the information in that report.

The Relative Roles of Voluntary Agencies and Government

Table 12 summarizes the contributions of these two components of the health care delivery system in Tanzania. As the data suggest, in 1973 almost one-half of all hospital services in Tanzania were provided by voluntary agencies. In contrast, all the rural health centers, and over 85% of the rural dispensaries were operated and financed by the Government.

Information on the relative proportion of ambulatory care provided by these two elements of the system indicates that about 25% of these visits were made to facilities operated by the voluntary agencies.

Approximately 22% of physicians (but over one-third of the expatriates) are in the service of the voluntary agencies, and almost 40% of the nurses, both at the A and B levels, are also employed by these agencies. As would be anticipated from the data on ambulatory care, over 80% of the medical assistants and rural medical aides are employed by the Government.

Estimates of the capital investment represented by the 62 hospitals operated by the voluntary agencies were not available. Presumably, since they represent 45% of the total bed supply, investment in these facilities should be approximately equal to the aggregate developmental costs of hospital construction supported by the Government.

The expenditures by the voluntary agencies in 1973 are given as 24,339,000 shilling.¹ (This includes costs of training.) Income that year included 7,838,000 shillings from grants-in-aid by the Tanzanian

¹Like Lightning From Heaven: Report of a Consultation of the Christian Medical Board of Tanzania in Dar es Salaam, 30 September to 4 October, 1974. Published by the Christian Medical Board of Tanzania, pp. 156, 1975.

government and 8,065,000 shillings from patient-fees. The deficit between this income and recurrent expenditures of 22,272,000 shillings apparently represents "gifts" from overseas donors.

Data on income and expenditures for 1975 are incomplete, representing reports from approximately 60% to 65% of the hospitals and dispensaries operated by the voluntary agencies.¹ Reported expenditures and income were extrapolated to represent 100% reporting. A review of the bed capacities of reporting and non-reporting hospitals in 1975 suggested that a linear extrapolation was reasonable because hospitals of approximately the same size were equally represented among those reporting and those not reporting.

These figures reflect a rather significant increase in recurrent expenditures for health services by voluntary agencies in Tanzania in the interval from 1973 to 1975. For example, while the 1973 data on total expenditures by voluntary agencies was 24,339,000 shillings, in 1975 it was approximately 45,760,000 shillings, or an increase of approximately 88%. In the same interval (1973-1975) the National budget for recurrent health expenditures in Tanzania increased by 63.3%. (Table 10)

The income sources of the voluntary sector reflects the increased governmental support of these activities--7,838,000 shillings in 1973 compared to 21,065,000 shillings to 22,166,000.

¹Data from the Christian Medical Board of Tanzania.

While there was apparently no official response to the recommendations made in the conference report of 1974, the Government and the voluntary agencies have reached an agreement that all future investments by outside groups in the provision of health services in Tanzania will be coordinated through the Government to improve national planning for health services.

IV. Access to Care, Self-Reliance, and Quality
of Health Services in Tanzania

There are three concepts or issues of considerable importance to those charged with managing the health sector. Two of these, increasing access to care and fostering self-reliance are goals supported by national policy. While the quality of services rendered is not a subject of comment in Government publications, in interviews and field visits there was considerable evidence of concern with not only the quantity of care provided in Tanzania, but also the quality of that care. Because these topics do not fit easily within any one of the "components" of the health care system, but are related to the interactions among manpower, facilities, organization and financing arrangements, they will be discussed separately in this section.

Access

The Arusha Declaration stated that free health services would be made available to all the people. Thus, access to care may be the most important measure of the successful implementation of health policy in Tanzania. While access is an important concept and a subject of general concern, it is somewhat difficult to define operationally. In fact, it is easier to define access, or lack thereof, in terms of the multiple types of barriers which must be overcome if individuals are to receive services. These barriers include: 1) geographic factors, including the distance that individuals must travel to obtain services, 2) the availability

of health professional manpower to meet the demands for service made by individuals, 3) economic barriers, including personal and/or governmental ability to pay, 4) organizational factors that inhibit the referral or transfer of patients to other facilities that serve more specialized functions, and 5) psycho-social factors, such as the individual's belief about the causation and prevention of disease, indications for use of health services, and willingness to comply with recommendations for treatment.

In Tanzania there have been attempts to deal with all of these barriers. For example, Government policies have attempted to locate rural dispensaries within 10 kilometers of all citizens. The elimination of geographic barriers is not complete, since the building of dispensaries involves developmental costs, as well as the recurrent expenditures required to staff such facilities, and to provide consumable supplies and drugs. A specific and rational policy, with regard to the training of manpower, has done much to reduce barriers related to the availability of personnel to provide services. Economic barriers have been eliminated by the policy of providing free care through Governmental facilities. The policy of free care also services as a reinforcement of villagization.

Comment

While the elimination of economic barriers is admirable, it threatens to become a significant problem in the immediate future. No other national health system, to my knowledge, has been able to operate with such a policy. Experience in other nations suggests that as other

barriers decrease, especially those related to the geographic distance and psycho-social factors, and as educational levels and income increase, utilization rates rise without reference to patients' needs for medical services, i.e., existence of disease. Other systems have found it necessary, if not desirable, to provide some dis-incentive for the utilization of health services, in order for the system to remain economically viable. The major question has been how to do this in the most equitable fashion, and in a way consistent with national policy.

Anecdotal evidence from the vast majority of those interviewed suggests that there are individuals in Tanzania whose use of the health services is not commensurate with their health status. Over-utilization was said to occur most frequently among individuals living adjacent to health facilities, to be related to seasonal demands for work, and a function of educational level. It was pointed out that when some individuals have money to pay for services, they travel long distances to mission hospitals, even when free services are available at a closer Government facility. Thus, it would seem that in Tanzania, the determinants of use of services known to operate elsewhere in the world may also prevail. If so, as the policies of the Government become effective in improving the general living conditions and socio-economic status of the population, utilization of services will increase dramatically.

There are a limited number of methods for capturing some of the costs associated with the provision of personal health services in a way so as to deter over-utilization--and thus more equitably distribute the consumption of scarce resources among individuals and among regions.

One method of accomplishing the twin goals of capturing some recurrent costs and encouraging more appropriate utilization involves the payment of a token fee at the time the individual presents for care. This has the disadvantage of making demands for payment at a time when individuals are least likely to be able to afford this contribution.

A more equitable approach involves prepayment for services on a population basis, i.e., contributions from a village development fund-- to support a portion of the costs of services to that defined population over a period of time. Such a method is consistent with the concept of self-reliance, i.e., the contribution of individuals to their own care. It could also be done in a way that payments on a per capita basis were adjusted to the relative income of a district or a region, i.e., on the basis of a sliding scale. However, this method provides a dis-incentive for inappropriate utilization only if peer pressures are exerted by the members of a social group on those individuals within that group who are excessive utilizers of service.

A discussion of over-utilization of medical care in Tanzania may seem inappropriate. Given the high prevalence of disease, it may resemble a discussion of the problems of fish drowning in water. Nevertheless, there are problems related to the distribution of utilization among the people, and these result in patterns of resource allocation that are contrary to the egalitarian orientations prevailing in this society.

The preceding has involved discussions of utilization rates. Use of services is not an adequate measure of the accessibility of care. Use only constitutes evidence that access has been achieved; it is not an adequate measure of the extent of non-accessibility of care due to any of the barriers enumerated. In the data available, rates of use reported are quite high. For example, the Minister of Health, in July 1976, stated that a total of 80,731,000 visits were recorded in hospital clinics, dispensaries, and rural health centers. This is equivalent to 5.5 visits per person per year in Tanzania. This figure obscures the fact that a significant proportion of the population undoubtedly received no health services on an ambulatory basis during that year, while a small proportion of the population accounted for the consumption of a significant percentage of all resources of this type. There is reason to believe (as will be discussed further in this section) that ambulatory care statistics may be inflated.

More information is needed to describe the distribution of the utilization of services as a function of the various barriers described. This is necessary if there is to be any consideration for establishing a method for villages to support some of the costs of health services provided. It is also critical in the design of programs to deal with the psycho-social barriers that are operating in Tanzania. The latter will be reviewed in more detail in the sub-section that follows.

Self-Reliance and Preventive Services

The national emphasis on a policy of self-reliance is highly admirable and consistent with the traditions of the African people. In her study of the socialization of children in a developing society, Varkevisser documents the extent to which Sukuma children are toilet-trained at an early age, expected to be responsible for the supervision of their younger siblings, and the maintenance of their own clothes at a far younger age than in western societies.¹ The emphasis on self-reliance also is manifested in programs where villages have helped build health centers, constructed water supply facilities, etc.

Comment

The concept of self-reliance is also important in terms of individual health status. While health services are essential in the treatment of illness, medical care can be provided in a fashion that fosters dependency. In contrast, the maintenance of one's health is totally dependent upon a self-reliant orientation. Self-reliance is essential for the establishment of life styles conducive to health, while medical care can become addicting, or at least create a sense that "others" have the responsibility for care. In societies where curative services are provided in abundance, there is some risk of translating all personal and social problems into "medical" problems and thus increasing the expectations

¹Varkevisser, C.M. Socialization in a Changing Society--Sukuma Childhood in Rural and Urban Mwanza. Smets Offset. Den Haag, 1973.

of individuals that medical care will provide solutions to these problems.

The concept of self-reliance in the field of health must, however, be viewed in terms of the essentials for self-reliant behavior. These are three in number--cognitive, affective, and resource-consuming. In other words, to be self-reliant an individual must want to do for himself/herself; he or she must know how to do what is necessary; and must also be able to perform these functions. The first is related to their orientations with regard to health, the second is their susceptibility to health education when defined narrowly as the transfer of information, but the third requires the provision of suitable resources. It is not sufficient to want to and to know how to be self-reliant in terms of health care, if the required resources, i.e., drugs for self-administration in the chemo-suppression of malaria, are not available.

Most health education activities are directed at that factor which is most susceptible to change--knowledge. While knowledge is important, it has been well established that information in the absence of motivation or a willingness to perform certain activities is of little value. In many interviews throughout Tanzania with health professionals, the effectiveness of health education activities was discussed. It was the general consensus that the majority of patients could repeat what they had been told with regard to the prevention of certain kinds of illnesses, how to use foods, why to use pit latrines, etc., but despite this knowledge, their behaviors, i.e., habits, were not altered.

Prevention, despite its appeal to health professionals, is not salient to most individuals in the world. To be "preventive-minded" requires a future-orientation, a willingness to defer immediate gratifications in exchange for the non-occurrence of possible adverse events in the future. It is associated with tendencies towards risk-aversion, and is correlated with psychological constructs such as locus of control and field-independence/dependence, measures of the degree that individuals feel they have some personal control over their fate or destiny. In most societies only those who are free from the immediate pressures of day-to-day living have, or can afford such orientations.

To those whose realistic concerns are how to survive the day, and if there will be food or sickness tomorrow, such orientations may be foreign. It is highly probable that there are very few individuals in Tanzania who are susceptible to current techniques of health education.

The most successful policies being advocated are those relating the provision of preventive services (especially as a prerequisite) to the provision of curative health services. Considering the prevalence of disease in the population and the burdens of day-to-day living, and given the present traditional beliefs about the causes and treatment of illness, it is not surprising that individuals are more concerned with the administration of medicines, preferably by injection, than discussions of how to prevent health problems.

A major opportunity exists in Tanzania for the generation of future adults with more appropriate health-related beliefs and behavior. The Government is implementing a program of universal primary education.

Within the structure of this educational experience there are possibilities of influencing the cognitive and affective elements of self-reliance related to health.¹ This would provide an exciting experiment in health education for an entire nation.

Despite the organization of the Country and the obvious effectiveness of TANU in affecting community involvement in activities, there have been few attempts to utilize the party in dealing with health care problems. Health is a political issue, not just a social and biological one. Perhaps the most effective means of increasing preventive activities and appropriate use of care is by emphasizing that self-reliance in health care is carried out for the good of oneself, one's village, and one's nation.

To this end, the village medical worker might more appropriately be titled the "village health worker." I have some major concerns about the preparation of village medical workers, since I believe there is a high probability that they will become, given the resources available to them, little more than untrained rural medical aides. There is an important element in the training of non-professional manpower that is related to "socialization" as a professional. One of the means of ensuring some degree of adherence to professional policies and ethics is the duration of training. For three-to-five years individuals are exposed to role models and certain precepts that serve to communicate the ethos of a

¹ Lewis, C.E. and Lewis, M.A. Child-Initiated Care. Final report of a research-demonstration project in primary schools, National Center for Health Services Research, Department of Health, Education, and Welfare, Washington, D. C., 1975.

profession, as well as its knowledge content. A brief exposure of two-to-four weeks may provide information, but it does little to create a sense of professional identity, a key element in the maintenance of professional performance. The village health worker could be selected by the village, and serve to translate, emphasize, reinforce, and ensure that the health activities of fellow villagers are consistent with the maintenance of optimal health status--within the limits of that environment.

Perhaps a link could be established with local traditional practitioners, not just to "control" their prescribing practices, but to utilize their unique contributions. Their unique role in providing relief from the guilt associated with illness in this society is of major importance. This function is not only therapeutic, it might be considered as a means of preventing more serious psychiatric problems.

Quality

The quality of health services traditionally have been assessed by an examination of the structure, process, and outcomes of care. Included under structure are the qualifications of practitioners, and the resources available within settings for care. Process measures include those day-to-day activities performed by practitioners as they go about establishing diagnoses and treating patients, while outcome measures, in terms of deaths, and levels of disease and disability, are the ultimate measures of the impact of care. Outcome measures, despite their appeal, are not feasible in any society at present for a variety of reasons. In the past, most

measures of quality depended upon structural measures, as assessed by inspection of facilities and the licensure and certification of practitioners. Recently, process evaluation has been used to supplement structural indices.

The comments that follow will be presented in terms of the structural and process elements observed in a non-random sample of field visits to two consultant hospitals, three district hospitals, one rural health center, and two rural dispensaries.

Structural Elements

In both consultant hospitals the facilities were quite adequate. Drugs were available and the staff were knowledgeable and enthusiastic. While the resources available in the district hospitals were less plentiful, they seemed quite adequate. The drug supplies were not reviewed, but it was stated that they often ran out of certain drugs so that not all medications required were available. At two of these hospitals a medical officer was present; in the other, a rural medical aide was in attendance. The personnel seemed well prepared and knowledgeable with regard to medical issues, as well as those related to the delivery of services.

At the rural health center, two rural medical aide students were in attendance. One rural medical aide graduate was on leave, and the medical assistant was in town. The resources were marginal. A refrigerator for

storing vaccines was quite warm, and while a thermometer was not available, it was operating at a temperature too high for adequate storage of measles vaccine. There were no batteries in the otoscopes, but the rural medical aide students seemed appropriately informed and interested in their work.

At one rural dispensary, a dispensary aide was present; at the other, two nursing assistants were on duty. In both facilities there were few drugs present, except injectable procaine penicillin. The facilities were adequate for the treatment of ambulatory patients, with the exception of the absence of minimal laboratory equipment, i.e., urine dip sticks and a hemoglobinometer. The most serious deficiency was the lack of medications.

Process Measures

The quality of care, as evidenced by the processes recorded on charts and observed on the wards, was extremely high in both consultant hospitals. The same was true of the district hospital, with few exceptions. At one district hospital it was standard procedure to perform gastric lavage on any child admitted with a reduced level of consciousness, on the assumption that all patients had been treated previously by traditional practitioners. This procedure was performed to remove whatever herbs had been administered, prior to instituting other treatment. Processes of management of patients were good, as observed in these brief visits. In one district hospital records indicated that 140 patients had been seen in the clinics that morning. Perhaps the only process measure of concern in these hospitals was the observation of a case of meningitis being treated with penicillin and chloroamphenicol in the medical ward rather than in the infectious disease area (which was empty).

Process measures observed in the rural health centers were not of the same quality. While a microscope was functioning, a "blood smear," which was being examined, was poorly prepared and not interpretable. Few vital signs were recorded on the records of patients, as found at the foot of the beds. Cases of malaria had no temperature recordings on the chart. Most patients were receiving antibiotics as well as other medications. However, a brief recording was present for each patient hospitalized, including a diagnosis. The treatments being administered were consistent with these diagnoses.

In the rural health centers there was no opportunity to observe the treatment processes since all patients had been seen by the time we arrived (late in the morning). In one case it was stated that 150 patients had been seen; however, 12 visits were recorded in the daily log. No records were kept on any patients, and in brief conversations with the aides present, it seemed that treatment was provided primarily on a symptomatic basis

Quality: Summary

These observations were on a non-random sample and certainly do not permit generalization. It seems highly probable that the quality of care provided in consultant and district hospitals is excellent, both in terms of the resources and practitioners available. Observations in the rural health centers and dispensaries, however, provide additional evidence of the importance of the setting in which practitioners function, as a determinant of the quality of care. While the products of the training

programs may be extremely well qualified, it has been demonstrated in other societies that individuals tend to practice at a level influenced greatly by the setting and the resources available to them.¹ It seems highly probable that well-trained practitioners, without necessary laboratory resources and those necessary for treatment, would find it difficult to provide care consistent with the standards advocated during training. Under these circumstances, it is highly likely that loss in competence or performance over time, which occurs among all levels of health professionals, would be accelerated.

While facilities that represent developmental costs require maintenance, and thus constitute a source of recurrent expenditures, the same is true with manpower. In fact, to some extent the situation may be more critical with regard to practitioners providing care. It is not possible to prepare practitioners, assign them to practice settings, and expect them to function without "maintenance," or formal efforts in continuing education and supervision. In manpower the risks may be greater, for while facilities that deteriorate to the point where maintenance costs exceed those of replacement can be destroyed, practitioners, once trained, are seldom prevented from providing care. The probability that within a few years the cadre of mid-level practitioners, now being produced in Tanzania at considerable cost (Table 7) may be providing care of dubious quality, must be considered. Mid-level practitioners are the most

¹Trussell, R. and Morehead, A., et al. The Quantity, Quality and Costs of Medical and Hospital Care Secured by a Sample of Teamster Families in the New York Area. Columbia University School of Public Health and Administrative Medicine, 1962.

appropriate personnel for the health care system in Tanzania. The policy decisions thus far have been extremely sound. However, mid-level practitioners throughout the world function optimally when considered as part of a "system" of care. This system must provide continued reinforcements, including incentives for improvement, supervision, and continuing education in order to maintain their level of performance. The system must provide the resources necessary for their maintenance. If economic constraints prohibit such maintenance functions then a balance must be struck between the allocation of resources for the training and payment of practitioners on the one hand, and resources for their continuing education or maintenance on the other.

V. Summary -- Recommendations

Most of the concerns defined in the previous sections were shared by one or more individuals interviewed in Tanzania. Only a few issues, such as those concerned with the village medical worker, and the greater involvement of TANU in the health sector, represent the views of the consultant.

Manpower

The Government of Tanzania has made considerable investment in staffing the health care system with non-physician practitioners (Table 7). The quality of the education being provided is excellent. The curriculum structure may be somewhat inefficient to the extent that it is patterned after that of a school of medicine rather than specifically designed to meet the training requirements for such practitioners. The number of practitioners providing direct patient care that will be produced in the next five years will significantly improve access to care. However, the burden of recurrent expenditures, not only for personnel salaries, but also for consumable supplies, especially drugs dispensed by them, will also be increased.

The lack of current plans for the development of a "support system" for these practitioners suggests that their proficiency will decrease, and that the quality of the services they provide will decline over time. Even though these practitioners are dealing with a limited number of

clinical problems, the lack of incentives for continued learning, the absence of adequate supervision, and deficits in the maintenance of the facilities and resources necessary for practice, constitute major threats to the maintenance of an acceptable level of quality of care.

Of lesser concerns are the selection process that tends to ignore dimensions other than cognitive ability, as well as the instability produced by frequent turnover of faculty members of training programs for medical assistants, rural medical aides, etc.

The proposal for training village medical workers seems questionable. The selection mechanism, the brief period of training, as well as the job descriptions provided suggest that these individuals will be ill-prepared to provide other than symptomatic treatment for their fellow villagers using whatever drugs are available. It was suggested instead that village "health" workers be appointed and receive training that would prepare them to modify existing patterns of behavior in the village that are inconsistent with good health practices. As teachers, translators, demonstrators, reminders and ensurers of the actions recommended by other practitioners who have received more training and socialization, they could serve a most useful role.

The quality of services provided by practitioners seemed to be a function of the setting of the practice, and was found to be deficient primarily because of the lack of resources. (including systematic support and supervision by more qualified practitioners). This also emphasizes the need for the planning of a support system for these practitioners.

The use of antibiotics seemed excessive, and it is undoubtedly related to patients' demands for "injections." Unfortunately, there is some evidence of the emergence of drug resistant microorganisms. This has rather unfortunate implications for patient care and drug costs.

Organization

The decentralization of Governmental functions has achieved major benefits by placing people at the village level in an important decision-making role. However, it has created problems related to the coordination of central government functions with those at the district and regional levels. In examining the organization chart for health services in Tanzania, the lines of authority and responsibility are not clear. It is essential to clarify the relative roles of those involved in the overall management of the health care sector. The organizational dilemmas described do not provide an adequate infra-structure for the reporting of information for operation of the health services, as well as the support of non-physician manpower.

Decentralization has placed a major burden, in terms of the planning and operation of health services, on the district medical officer. These young physicians, usually recent graduates from the School of Medicine and awaiting an appointment for postgraduate training, are poorly prepared for the key decision-making, advising, and planning elements of this job. The possibility of substituting other practitioners who might assume these aspects of the district medical officer's functions might be considered.

For example, special training in management and health planning for assistant medical officers might produce a stable and continuing pool of manpower that could function in these particular roles at the district level.

Financing

The rising costs of health services in Tanzania are the major cause of concern. While the policy of free care has reduced the economic burden to the individual, the question of whether or not the Government can afford the costs of care must be considered in future planning. The escalation of costs, evident over the past few years, should accelerate in the future due to: 1) an increased rate of manpower production, involving recurrent expenses for salaries and supplies, 2) increasing use of services as socio-economic conditions and education status improve in the population, and 3) the possible development of microorganisms that are resistant to the cheaper and more commonly used antibiotics, such as penicillin. If penicillin-resistant organisms develop, there will be a significant increase in drug costs.

Capturing some of the recurrent costs associated with the provision of personal health services at the village level is in direct conflict with national policy. However, it may be necessary (as was the case with education and water supplies) to modify this policy, both as a means of providing some sources of revenue for the health sector, as well as a means of stimulating more appropriate utilization of services. The alternatives have been discussed, and it has been suggested that a prepaid-

capitation plan, with a sliding scale based on regional income, coupled with more active political involvement or increase in peer pressure on those who are excessive users of care may be the least offensive alternative.

The present salary structure encourages postgraduate specialization by physicians. Consideration might be given to increasing the salaries for medical officers who are performing management and public health activities, or providing them special status through postgraduate training in family practice or public health.

Preventive Services and Self-Reliance

Given the problem of interesting the population in prevention and the ineffectiveness of most educational programs concerned with altering health beliefs and behaviors, consideration might be given to the creation of demonstration activities with individual participation at the village level. The opportunity to do this through primary education, i.e., activities in the school that reinforce the concept of self-reliance, should be considered. The party, TANU, could also play an important role in this effort. Since this is an area about which very little is known anywhere in the world, Tanzania has an opportunity to provide leadership for others who are struggling with the same issues, but without a basic national policy consistent with these goals.

Recommendations

1. The development of a plan for the training of non-physician manpower that considers future needs/resources with a projection of possible reductions in training activities.
2. Further evaluation of the potential limits and risks of the village medical worker proposals versus the possible benefits from the development of a village "health worker."
3. Development of a support system for all health manpower that considers their needs for continuing education, maintenance of competency, and supervision.
4. Continuation of present activities related to revision of the curriculum of these programs with an eye toward increased efficiency, i.e., a reduction of time and cost to achieve the same product.
5. Consideration of the effects of current remuneration of physicians on specialization, and the development of a plan to avoid financial reinforcement for specialty training.
6. Continued emphasis on the basic essentials of health, i.e., the provision of water supplies, improved sanitation, and general increase in the socio-economic status of the population.
7. Further delineation of the organizational structure of the health system, and the development of an infra-structure that provides data for improved management of the health sector.
8. Institution of a plan for cost recovery for personal health services that also serves the function of providing a deterrent to over-utilization.

9. Development of programs to modify the health beliefs and behaviors of consumers of health services in Tanzania. These would include demonstration activities at the village level, as well as the introduction of educational activities in the primary schools, and a greater role by TANU in health activities.

10. Strengthening the management skills of the district medical officer, or transferring these responsibilities to another health practitioner who has received special preparation in the areas of health planning and management.

11. The development of a program in health services research (presently planned) should be accelerated in order to provide both resources for evaluation of current activities in the health sector, as well as information that would aid in policy development and modification. Such a unit should report directly to the Minister of Health. The first such effort might involve implementation of an existing protocol for the surveillance of serological responses to measles vaccine.

TABLE 1. Relation of Education and Mortality
in Dar es Salaam, 1967

<u>Education</u>	<u>Infant Mortality*</u>	<u>Survival to Age 5(%)</u>	<u>Life Expectancy (Years)</u>
None	155	73.9	41
1-4 years	115	80.8	48
5 or more	82	86.8	56

*Per 1000 live births.

Table 2. Most Common Causes of Death in Hospitals 1971-1974

<u>Causes</u>	<u>Tanzania Mainland</u>			
	<u>% of the Total Number of Deaths in Hospitals</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
1. Pneumonia (all forms)	15.0	15.6	14.1	13.4
2. Gastroenteritis (all forms)	6.1	9.6	9.0	10.2
3. Malaria (all forms)	6.8	4.4	4.5	3.9
4. Tuberculosis (all forms)	5.0	4.7	4.5	4.8
5. Defective Nutrition	5.7	5.1	6.9	7.8
6. Anemia (all forms)	5.8	3.8	4.9	4.5
7. Condition of Early Infancy	5.4	6.9	3.4	7.9
8. Measles	4.4	10.5	11.1	8.9
9. Tetanus	3.4	4.6	3.8	1.9
10. Diseases of the heart	5.7	4.5	4.5	4.6
11. Meningitis	1.5	0.9	1.4	0.6
Total Number	64.8	70.6	68.1	68.5
Actual Number	7450	7955	9983	6904

TABLE 3. Most Frequent Causes of Admissions to Government and V. A. Hospitals

<u>Causes</u>	<u>1971-1974</u>			
	<u>Tanzania Mainland</u>			
	<u>% to All Admissions</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
1. Deliveries, complication of pregnancy, childbirth and puerperium.	19.4	21.9	18.3	16.0
2. Malaria (all forms).	11.2	7.3	8.4	6.7
3. Pneumonias.	6.4	6.5	6.8	6.6
4. Gastroenteritis and other diarrheal diseases.	5.9	6.5	6.2	2.5
5. External causes of injuries.	5.5	2.1	2.0	3.1
6. Ankylostomiasis.	2.8	2.6	2.7	3.2
7. Measles.	2.5	4.3	4.0	2.7
8. Iron-deficiency anemias.	2.2	2.8	1.9	4.3
9. Tuberculosis (all forms).	1.0	1.8	1.7	1.3
10. Bronchitis, emphysema, and asthma.	2.2	2.2	2.6	4.0
11. Neoplasma (all forms).	1.5	1.5	0.7	1.0
12. Ascariasis.	1.8	1.9	1.9	2.3
13. Other anemias.	2.4	2.8	1.9	0.7
14. Acute respiratory infections.	1.4	1.4	1.5	1.0
15. Dysenteries.	1.3	1.6	1.6	0.9
16. Infections of skin and subcutaneous tissue.	1.3	1.7	1.7	1.1

(TABLE 3 CONTINUED)

<u>Causes</u>	<u>% to / Admissions</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
17. Bilhazia.	1.2	1.2	1.3	1.5
18. Hernias.	1.2	1.4	1.0	1.2
19. Protein Malnutrition.	1.0	1.1	1.2	0.9
20. Other nutritional diseases	1.0	0.9	1.0	0.6
21. Whooping Cough.	0.7	0.8	1.0	0.5
22. Nutritional marasmas.	0.5	0.5	0.6	0.9
23. All other causes.	24.3	25.2	29.8	37.0
Total	100.0	100.0	100.0	100.0
Actual Number	518,408	484,593	584,244	433,406

TABLE 4. Most Frequent Causes of Attendances in O.P.D.'s, 1971-1974

<u>Causes</u>	<u>% of Total O.P. Cases</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
1. Malaria (all forms).	9.4	13.9	13.1	10.3
2. Symptoms and ill-defined conditions.	7.6	7.8	8.9	9.1
3. Other disease of respiratory system.	4.8	5.3	6.6	5.2
4. Other disease of digestive system.	11.5	6.3	5.7	4.5
5. Accidents, poisoning, and violence.	5.9	5.9	5.8	6.0
6. Ulcers.	4.0	4.5	5.2	4.8
7. Gastroenteritis.	4.9	5.4	5.4	5.6
8. Bronchitis.	4.7	4.8	5.2	4.8
9. Nutritional deficiencies.	3.5	1.1	3.9	3.6
10. Inflammatory diseases of the eye.	2.9	3.6	2.4	2.4
11. Ankylostomiasis.	2.4	2.1	2.8	2.9
12. Scabies.	2.3	1.2	1.7	1.0
13. Disease of the genito-urinary system.	2.4	1.7	2.0	2.1
14. Pneumonias.	3.2	3.2	3.2	6.9
15. Gonococcal infections.	1.9	1.7	1.7	1.5
16. Enteritis and diarrheal disease.	6.8	9.1	4.6	2.9

(TABLE 4 CONTINUED)

<u>Causes</u>	<u>% of Total O.P. Cases</u>			
	<u>1971</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>
17. Schistomiasis.	1.6	1.6	1.8	1.4
18. Dental caries.	1.6	1.6	2.3	2.0
19. Measles.	1.2	1.4	1.5	1.0
20. Otitis media and Mastoiditis.	1.0	1.3	0.4	0.9
21. All other diseases.	15.9	16.5	15.8	21.0
Total	100.0	100.0	100.0	100.0
Actual Number	7,914,417	7,969,610	5,724,619	5,887,618

FIGURE 1. Relations of Preventive Efforts

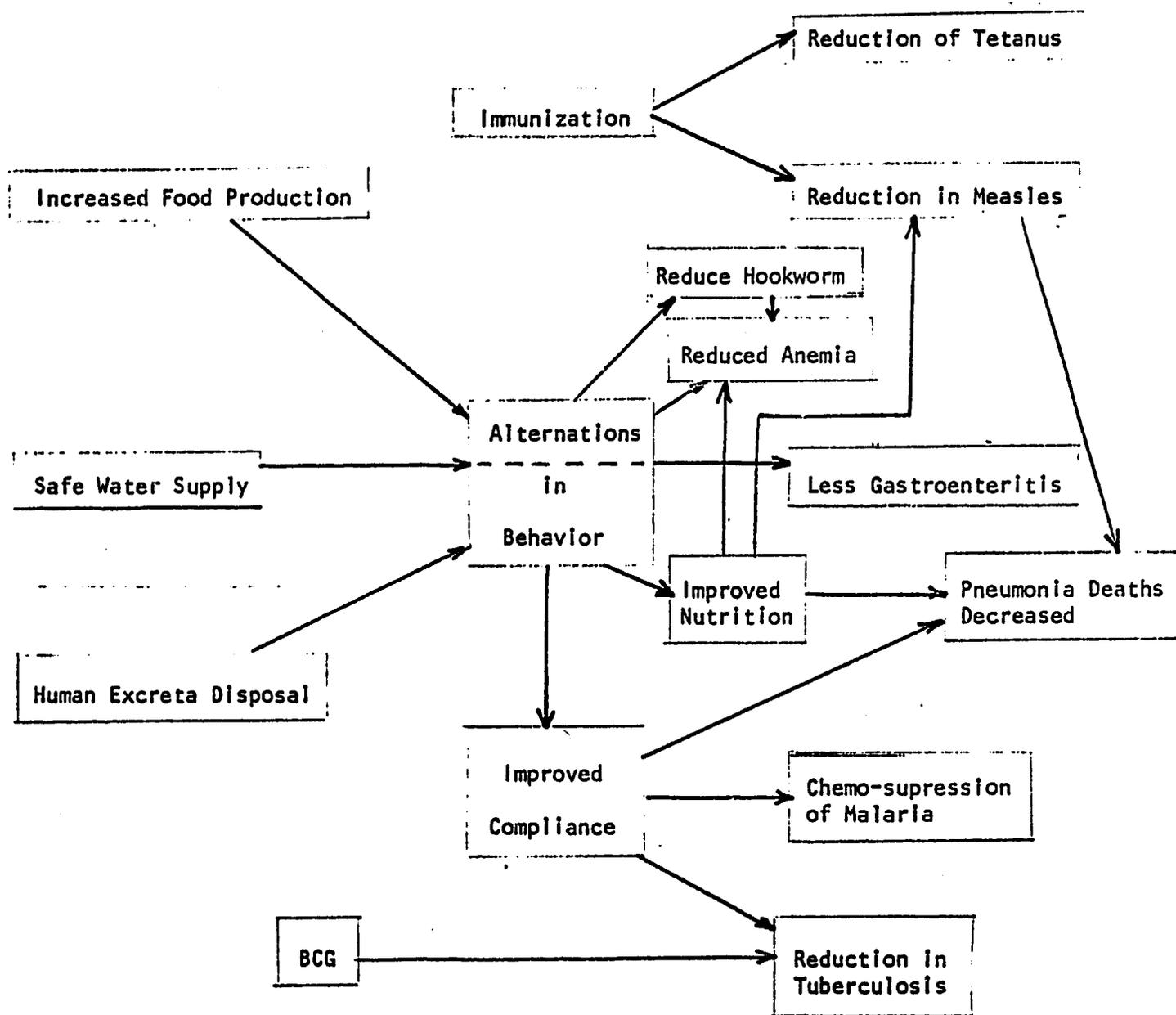


TABLE 5. Responses of Children in Interviews in Swahili

Bugando Consultant Hospital, September 18, 1976

From	Village	Village	Village	Village	Mwanza Town
Sex	Female	Male	Male	Male	Male
Age	12	15	9	10	15
School level	3rd Standard	Yes	Yes	2nd Year	4th Standard
Siblings	4	4	5	6	--
Ordinal rank	3rd	3rd	2nd	2nd	--
Diagnosis	Pott's Disease	Pulmonary Tuberculosis	Burkett's Lymphoma	Endocarditis Pericarditis	Fracture of the elbow
Why are people here? (in hospital)	Sick	Sick	Sick	Sick	Sick
How did they get sick?	Diseases are in village.	?	Illness just started.	Got bewitched.	Caused by environment.
Perceived vulnerability.	Greater	Greater	Cannot answer.	Greater	Same, but has headache\$.
Perceived severity.	Always tell.	Always tell.	Always tell.	Always tell.	Always report.
Perceived benefits of	--	--	--	--	--

(TABLE 5 CONTINUED)

Do you know anyone who pretends or plays like they are sick?	No one does, always when sick we are taken to doctor and proved to be sick.	Smiled, but said, "no."	Knows no one.	Knows no one.	Some kids at school pretend.
When no sick, what are you?	Healthy	Healthy	I am playing.	Playing	Healthy
How do you keep well?	Take medicine	Vaccination	?	Eat food	Hygiene
Is food important?	Not asked	No	Yes	Yes	Yes
Ever seen a traditional doctor?	Yes	No	No	No	No
Do you believe witchcraft causes illness?	Yes	Yes	No	Not asked	Not asked
Parents present.	No	No	Yes	Yes	Yes

TABLE 6. Health Manpower Production in Tanzania^(a)

<u>Type</u>	<u>Training Centers</u>		<u>Average^(b) Class Size</u>	<u>Duration of Training</u>	<u>Numbers 1975</u>	<u>Graduates 1975-80</u>	<u>Total As of 1980</u>
	<u>Number-1976</u>	<u>Target</u>					
Physician	1	1	50	5 yrs.	637	238	875
Assistant Medical Officer	1	1	33	1.5 yrs.	160	155	315
Medical Assistant	6	7	250	3 yrs.	605	1185	1790
Rural Medical Aide	13	17	500	3 yrs.	790	2375	3165
Maternal-Child Health Aide	16	18	450	1.5 yrs.	910 ^(c)	2135	3045
Nurse-A	4	4 ^(d)	120	3-4 yrs.	1065	570	1635
Nurse-B	19	20	400	3-4 yrs.	3400	1900	5300
Dispensary Aides ^(e)	?	?	--	2-4 wks.	?	--	--
Totals	60	68	1803	--	7567	8558	16,125

a) Includes those providing direct personal services.

b) Based on data from information published by Planning and Analysis Section, Ministry of Health, June 26, 1976.

c) Includes village midwives.

d) Allocation of 24 nursing schools as target, not clear.

e) Training is in-service and variable.

TABLE 7. Investments in Health Manpower in Tanzania

<u>Type of Practitioner</u>	<u>As of 1975</u>		<u>As of 1980</u>	
	<u>Number</u>	<u>Investment*</u>	<u>Number</u>	<u>Investment</u>
Physician	637	159,250,000	875	218,750,000
Assistant Medical Officer	160	2,560,000	315	5,040,000
Medical Assistant	605	9,680,000	1790	28,640,000
Rural Medical Aide	790	7,900,000	3165	31,650,000
Maternal-Child Health Aide	910	9,100,000	3045	30,450,000
Nurse-A	1065	17,040,000	1635	26,160,000
Nurse-B	3400	34,000,000	5300	53,000,000
<hr/>				
Total		239,530,000		393,690,000
<hr/>				
Five Year Investment			154,160,000	
<hr/>				

*In shillings.

TABLE 8. Salary Ranges for Selected Health Personnel--1975-1976

<u>Category</u>	<u>Salary Range (Shillings/Month)</u>
Physicians	2100-4200
Interns	1955
Assistant Medical Officer	1420-3705
Medical Assistant	1315-3450
Senior Rural Medical Aide	1315
Rural Medical Aide	575-820
Maternal-Child Health Aide	430
Nurse-A	1315-3450
Nurse-B	430-600

TABLE 9. Recurrent Expenditures for Salaries of
Selected Types of Health Personnel - 1975 & 1980

<u>Type</u>	<u>1975</u>	<u>1980</u>
Physicians	19,492,200	35,836,000
Interns	703,800	1,569,600
Assistant Medical Officers	2,726,400	6,930,000
Medical Assistants	12,356,520	51,852,720
Rural Medical Aides	5,451,000	29,255,610
Maternal-Child Health Aides	4,695,600	21,025,725
Nurse-A	21,751,560	44,687,820
Nurse-B	18,931,200	39,490,300
<hr/>		
Total Shillings/year	86,108,280	230,607,775

FIGURE 2. Organization of the Health Sector in Tanzania

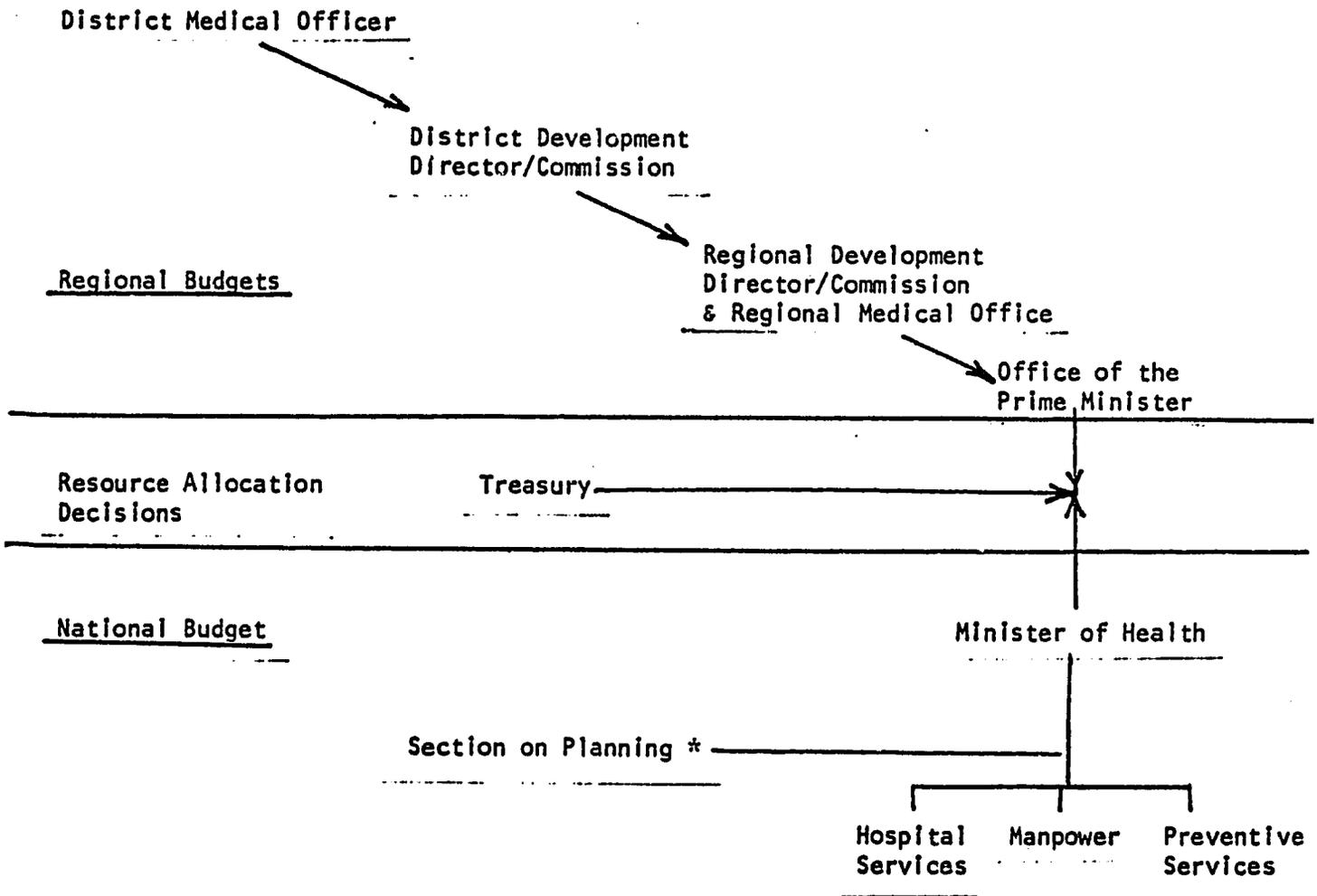


TABLE 10. Annual Expenditures -- Ministry of Health

	<u>1970-71</u>	<u>1971-72</u>	<u>1972-73</u>	<u>1973-74</u>	<u>1974-75</u>	<u>1975-76</u>	<u>1976-77(a)</u>
Developmental	22,035	4,385	15,328	58,000	72,369	73,377	97,732
Recurrent	135,757	154,520	192,594	205,693	301,882	335,977	405,910
Hospital Care	79.8%	78.9%	71.6%	69.0%	60.2%	60.4%	60.7%
Rural Health Centers	4.3	5.5	4.9	6.9	7.4	7.7	8.5
Dispensaries	4.8	5.4	13.4(b)	12.4	11.7	11.8	12.3
Preventive Services	5.0	3.9	3.9	4.7	12.4	11.1	10.7
Training	2.4	3.1	3.5	4.8	6.3	6.7	5.8
Total	157,792	158,905	207,922	263,693	374,251	409,354	503,642

(a) Estimates.

(b) Increase reflects shifts of some costs from local to National level.

TABLE 11. Trends in Governmental Expenditures for Health

	<u>Gross Domestic Product Index</u>	<u>National Government Recurrent Expenditure Index</u>	<u>National Government Health Recurrent Expenditure Index</u>	<u>National Government Health Recurrent Expenditures In Millions Shs.</u>
1961-62	100	100	100	47.9
1965-66	147	119	127	60.6
1970-71	212	241	224	107.5(a)
1973-74	298	391	484	231.7(b)
1975-76	427	538	702	336
1976-77	--	--	--	405
1980-81	?	?	?	1133(c)

(a) Rural health centers budgets transferred to National Budget.

(b) Rural dispensary budgets transferred to National Budget.

(c) Estimate based upon extrapolation of proportion of recurrent expenditures for salaries (.256) from 1975-76 to 1980-81 (see Table 9), and assuming 6 percent per year growth inflation of all costs.

TABLE 12. Relative Size of Governmental and
Voluntary Agency Components of the System

	<u>Government</u>	<u>Voluntary Agencies</u>	<u>% V.A.</u>
Hospitals	65	62	48.8
Beds	9,962	8,202	45.7
Admissions	460,000	179,798	39.1
Rural Health Centers	180	0	0
Dispensaries	1,342	208	13.4
Outpatient Visits			
Total	18,095,000	6,034,620	25.0
Pre-natal	1,121,272	400,262	22.0
Child Health	1,015,519	625,884	37.0

Based on 1973 data compiled by Dr. Ursula Hay, Christian Medical Board of Tanzania.

M E E T I N G S

- September 9, 1976 Lyle Hausen, Resident Director, World Bank Mission
Tanzania, Dar es Salaam.
- September 10, 1976 Dr. Kaleo, Principal Secretary, Ministry of Health
Dr. R. Manning, World Health Organization Representative
to Tanzania.
- September 13, 1976 Mr. Adel, Office of Planning, Ministry of Health
Dr. Dhulla, Office of Planning, Ministry of Health
Dr. Cheduo, Director of Manpower, Ministry of Health
SIDA group
Dr. Heidinger, U.S. AID Program.
- September 14, 1976 Dr. R. McMahon, Director, Seminar/Workshop on
Education Methodology for Teachers of
Medical Auxiliary Schools
Dr. H. Matovu, Director, Center for Medical Education,
Kampala, Uganda.
- Workshop on Curriculum, Medical Assistants Training
Centers
Kilimanjaro Christian Medical Center, Moshi
Of the 35 Participants, the following were interviewed
in some depth:
Dr. P. Manschot, Mwanza
Dr. J. Eshuis, Medical Officer, Mwanza
Dr. P. M. Timmerman, Mechame
Dr. R. S. Shee, Medical Officer, Tanga
Dr. I. S. Kesanga, Principal, Mechame Medical Assistants
Training Center
Dr. Teri, Coordinator, Assistant Medical Officer,
Training Program, Kilimanjaro Christian
Medical Center, Moshi.
- September 15, 1976 Dr. Lyimo, Medical Supervisor, Kilimanjaro Christian
Medical Center
Miss Klinger, Laboratory Auxiliary Training Program
Miss Goodchild, Radiology Auxiliary Training Program
Ms. Mnaulau, Director, Nurse Training Program
Ms. K. Stromsholon, Medical Library Training Program.

September 16, 1976 Dr. Dahoma, Regional Medical Officer, Mwanza
Dr. I. Williams, Pediatrics, Bugando Hospital
Dr. P. Poore, Pediatrics Bugando Hospital
Dr. F. Machera, Pediatrics, Bugando Hospital

September 17, 1976 Field Visits:
Bukumbi Hospital
Rural Health Center at Misungwi
Rural Dispensary at Nwanangwa
Rural Dispensary at Djojilo
District Hospital in Ngudu
Sumve (Mission) District Hospital
Dr. A. Chonji, Ob/Gyn, Bugando Hospital
Dr. M. Corochan, Internal Medicine Hospital

September 18, 1976 Five Pediatric patients

September 20, 1976 Sister Mary Reece, Maternal Child Health Training
Program, Dar es Salaam
Ms. Marilyn Bennet, Maternal Child Health Training
Program, Dar es Salaam
Prof. A. S. Msangi, Professor and Chairman,
Department of Zoology, University of
Dar es Salaam

September 21, 1976 Mr. A. Hondo, Acting Principal Secretary, Catholic
Bishops Council
Dr. P. Kitundu, Head, Traditional Medicine Research
Unit, University of Dar es Salaam

September 22, 1976 Dr. A. Nhonoli, Dean, Faculty of Medicine, University
of Dar es Salaam
Dr. Toremo, Head, Preventive Services

September 23, 1976 Mr. Kabona, Treasury

September 24, 1976 Dr. Yudkin, Department of Medicine, Faculty of Medicine
Dr. Kilama, Department of Community Health,
Faculty of Medicine
Dr. Toremo, Director of Preventive Services,
Ministry of Health

September 25, 1976 Dr. McGonagle, World Health Organization, Dar es Salaam
Dr. Toremo