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9. ABSTRACT <p>Discusses present health services in Zimbabwe and problems anticipated with the change from minority to majority government. The health care system is presently segregated, as are all other phases of life in the country. Race is the prime criterion by which the available resources are allocated. Preventive medicine is practiced largely in areas where there is economic concern or there is a European population. Priorities for health care are: (1) the training of health personnel at all levels and more efficient use of this personnel; (2) extension of service, particularly to include an improved rural coverage; (3) shift of emphasis from hospital-based to community preventive services; (4) improved hospital services through the training and provision of specialists, better administration, maintenance and equipment, and more rational siting of hospitals; (5) elimination of communicable and preventable disease; and (6) improvement in environmental sanitation and control. The availability of safe water supplies and waste disposal methods would greatly reduce morbidity and is one of the most basic of preventive measures. The health systems of Mozambique and Angola are presented as examples of territories with similar health problems based on their colonial systems. Cuba is studied as an example of a nation that has undergone revolutionary changes in its political and health systems. Sections on programmatic implications of this study and recommendation for a health care organization are included.</p>			
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FINAL REPORT

HEALTH CONSEQUENCES OF
TRANSITION IN ZIMBABWE

by

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HEALTH CONSEQUENCES OF TRANSITION
IN ZIMBABWE

OVERVIEW

The essence of information regarding health services in Zimbabwe is presented in this paper together with problems anticipated to be germane to political transition, i.e., minority to majority government.

In addition to the existing gaps in the present service system, it is anticipated that in the event of accelerated warfare; "white flight", the problems of food, clothing and shelter will be multiplied, due to the loss of critical personnel. This would in the short run result in decreased production of services and supplies.

The etiology of morbidity and mortality are of necessity included as rational solutions cannot be speculated without the information generated from that body of knowledge. Preventive measures related to the community and health education strategies, both with community participation, are extremely important especially in the solution or amelioration of environmental health problems in rural areas.

The traditions and value systems of the indigenous population have been investigated and examined "in vitro" as the

success of any endeavor such as this is totally dependent upon the involvement of the population at the "grass roots" level, and its felt needs.

The health care system in Zimbabwe is segregated as are all other phases of life in the country - race being the prime criterion by which the available resources are allocated. 1/

The maintenance of two separate hospital facilities or health centers in the same area is not uncommon. Such elementary services as nursing in the home are a "for white only" benefit in the cities. The low priority placed on preventive services to Africans is evidenced by Webster who states that the hospital bed utilization in 1968 for the population in terms of admissions, i.e., 105 in every 1,000 whites, and 125 in every 1,000 Africans are hospitalized per year as of 1968. 2/ "The high rate of hospitalization among Africans is of some extent, of course, a reflection of the high rates of morbidity, mostly from preventable disease..." 3/ Of course, there are other socioeconomic factors involved.

As is the case in any comparable setting, it has been found that this policy of "separate development" is costly not only in terms of money, manpower, and facilities but in terms of human dignity.

As will be brought to light, the African and the European populations are subjected to completely different disease-risks. The European is likely to have disorders not unlike the prevalent chronic illnesses one would find in the United States; while

his Black brother is ravaged primarily by maladies common in under-developed countries. One must bear in mind that this phenomenon is perpetrated in the same environment but with completely different life styles and accesses to amenities which we regard as the basics of living.

Since whites have different risk-factors and different outcomes of risk-encounters, it is not difficult to understand the reasoning for instance, for great emphasis on curative medicine in this segregated society. Preventive measures have largely been in areas where there is economic concern or relatively dense European-populated regions.

What are termed childhood diseases in the United States are devastating to the African child. Before a campaign against measles was initiated, this relatively minor disease, when posited in the context of the Western world, was a prevalent cause of mortality among African children largely due to their compromised nutritional state. This disease is being contained somewhat at the present time.

The availability of safe water supplies and waste disposal methods would greatly reduce morbidity and is one of the most basic of preventive measures. Public health history tells us that the health status of the population is more a function of the effectiveness and efficiency of environmental and preventive services than by curative or therapeutic measures in hospitals. 4/ Again, Webster agrees that "the usual lip service is given to promotive and preventive health services..." 5/

The argument has also been encountered that the African does not appreciate the value of health education and preventive medicine since many methods are alien to their traditions and customs. This, however, is a crucial area where the Europeans, so to speak, "miss the boat" in the delivery of health care to the indigenous population. The notion that Africans do not believe in preventive medicine is a reason for its not being fully implemented. This concept is erroneous since Africans have always believed in "preventive" measures to avoid illness. Munyaradzi in addressing this issue states:

Ancestral spirits should from time to time be appeased by praying to them and offering gifts to the elderly living members of ones family whose duty it is to appease the ancestral spirits. Hence, respect is shown to ones elders in African society since if it is not shown to ones elders in African society since if it is not shown their services cannot later be solicited or should they die feeling offended, they then pass into the spirit world from where they can return and cause havoc to ones health. Further, we find that the African who receives medical attention may also take the same illness to a folk practitioner in some cases because the Western medicine failed to achieve the expected results or if the disease becomes worse or if a particular set of circumstances or symptoms appear to be peculiar to Africans such as those symptoms in connection with mental illness or if there is an appearance of symptoms which the extended family considers to be unusual. 6/

In the evolution of Western medicine in Zimbabwe, in the 1800's, missionaries such as Moffat and Livingstone, and the entrepreneur Cecil Rhodes, made great impact on the land which is now Rhodesia. While Moffat and Livingstone were paternalistic in character, they with their missionary

zeal attempted to win over the African with their limited medical technological skills, while on the other hand Cecil Rhodes was termed a "land grabber and imperialist". However the African, as Gelfand states, swarmed to the wagons of Moffat and Livingstone seeking medical care or even the simplest means of aid. 7/

Situations will be examined with the following criteria in mind: the relative magnitude of the problem, the relative amenability of the health problem to modern health improvement practices, and the relative influence of health programs to the community's well being. Without sanitation, safe water supplies other programs are ineffectual. Lowe again states that a "decline in communicable diseases is a major cause of increased life expectancy in infants, childhood and adolescence. 8/ Inhabitants must feel the need but not as a result of an imposition of outside pressures in determining their priorities in health. The above can be implemented most effectively through health education. Health education and preventive measures in Zimbabwe have been touched on earlier but their importance demands more review.

We find that health education is not taught at any level in Zimbabwean schools. But, it is extremely important to change attitudes regarding health in early years of life. Children may have a direct influence on explaining and changing attitudes in adults, with the hopefully resultant behavioral change. The main source of health education is conducted by

the Ministry of Health and a Local Authority Health Department, however, the Rhodesian Red Cross and other volunteer organizations contributed to the limited success of this discipline of public health. As in the case with preventive medicine, the missions are not a particularly driving force in this field. The activities are carried out by trained personnel but again we see the value of the concept of the least common denominator, the extended family health worker. These health workers are indigenous persons, their forte being that they are the only persons who live in the environment and are able to identify with its problems and therefore offering the best hope of success.

Dr. Carl Smith of the Department of Social and Preventive Medicine at the University of West Indies conducted an extensive study on health priorities in under-developed countries. Smith begins by defining priorities:

Health priorities here refer to clinical as well as other health activities. Poorer countries are those which might come near the lower ends of lists ranking nations on such indices of sophistication and development as gross national product, gross domestic product and per capita income. Priorities might be thought of in terms of needs and demands, as seen by the different agents in the health contract, namely the constituents (the community), the national responsible agents and the deliverers of the service including the medical and health professionals and para-professionals 9/

There are those social scientists who claim that setting health priorities for an under-developed country is impossible.

They claim that the health of the people of a nation is affected by changes in the social pattern. Smith determines that some of the main areas of concern are as follows:

1. The training of health personnel at all levels but particularly those described as allied health personnel; and, the more efficient use of this personnel.
2. The extension of service, particularly to include an improved rural coverage.
3. A relative shift of emphasis of hospital development from hospital based, to community preventive services. This is not to suggest that hospital services must be stopped.
4. Improvement in the quality of hospital services through the training and provision of specialists, better organization and management, improvement in maintenance of plants and equipment, and more rational siting of hospitals.
5. Elimination of communicable and preventable disease, where they are still prevalent, in the shortest possible time.
6. Improvement in environmental sanitation and control. 10/

The six (6) priorities mentioned above are those of most of the under-developed nations of the world. But, one can readily see how they would fit the situation of a country such as Zimbabwe for future planning.

We reiterate that the health care complex in Zimbabwe is consistent with the European cultural dominance in that country. Health care is largely episodic in nature and metropolitan based in concept. This latter emphasis leaves vast areas untouched and relatively uninhabitable in terms of being at least symbiotic with man. Widespread utilization of preventive

medical measures and health education in terms of money, manpower, and facilities is almost non-existent. In cost-benefit terms, therapeutic services are less efficient and beneficial than other priorities. This is due largely to the lack of commitment of these resources to areas other than those which are productive, by virtue of expedients in the area, or are inhabited by a reasonable number of Europeans. The impact of the apartheid-like political hegemony is prevalent throughout the "system" and therefore care is completely segregated. Again, experience in the field of health care delivery as well as other systems of service has demonstrated that this duality is wasteful in terms of resources, since ultimately "the stick that beats the black dog beats the white dog also."

In a country with so many infectious and parasitic diseases whose life cycles are dependent partially on residence within available species, frequently man, there is a definite need for commonality of effort to expand health services, particularly public health and preventive medicine to the entire population. These measures, as have been pointed out many times in the literature, are most cost-beneficial and efficient, and present a rational positing of priorities. According to K.A. Smith, a common example of misplaced priorities in a poor developing country might be the existence, in the presence of gross malnutrition among a large percentage of children, of such a specialized facility as an open-heart surgical unit. This is obviously an

irrational ordering of priorities as far as concerns of the interests of the majority. Yet, it may be justified by others as a measure of excellence and high status activity." 11/ Further, the use of western medical technology has not been utilized in the context of African values and improvements in environmental conditions have not been realized to the extent to which this technology can be fully implemented. The potential exists for basic environmental improvements to yield a substantial contribution to the economy by way of increased productivity through decreased morbidity. A sound, responsive, and sensitive health education model based on the attitudes of the populace in question is paramount in this endeavor. Smith again states, assessing prioritization by village people in health programs, that they usually want improvement in socio-economic status and quality of life, then environmental changes such as water supply and waste disposal; and, finally, organized health services which are ordered in priority as last. 12/

Inherent in the process of finding solutions to the problems lies the decision making process itself. The determination of who makes those decisions and how they are motivated to these decisions is crucial. 13/

The solutions to these problems must now be approached in a more logical manner, that is, planning on a consensus basis with involvement of all groups rather than decision making on an authoritarian basis. It is particularly important in this particular situation that we utilize...

Input from the diverse cultural backgrounds which can be made in a constructive sense if there is hope of its utilization. This is the reason for a great amount of frustration of the disadvantaged components of our society. The participatory concepts of a democracy have been impressed upon the poor yet when a vehicle for their input has been made available, the pros and cons of the feasibility of their participation becomes the object of great debate as to its benefits. (Watson)

As a result of this study, the input system should be of major importance.

Since health entails more than the actual lack of ability to function, we will say that the sense of health encompasses the physical, mental, social, and economical well being of the population. The population of society is served by systems, i.e., human service systems, public and private and we may say that the quality of life in any setting is a function of the effective output of the service system. Information to be interjected into the system may be a positive or negative response to system output, but in any case it represents the effectiveness of previous input into the system. Thus, all input is valid*, as it is the expression of the previous output.

Based on this assumption, it may be said that the lack of responsiveness to input be it positive or negative, is an expression of inefficiency in terms of consideration of the input. In like manner, this use or non-use of valid input is also an expression of unresponsiveness. (Watson)

Keeping in mind the following concept that:

These systems may have a positive effect on the quality of life if they are dynamic, that is, responsive to an 'utilizant' of information generated from recipients with careful regard to differences in values. Input must be recognized as being valid though they may be based on the values and attitudes of another culture rather than those of the hegemonic society. The degree of responsiveness can be based on the validity of feedback or input, i.e., information interjected into the system at any appropriate intervention

valid - in this sense, indicative of, or based on the attitudes of a culture, though not necessarily well grounded on established principle or evidence.

point. Since this feedback is valid, that is, indicative of representation of the recipient group and its values, new goals are set to meet the demand. Thus the goals are continually changing sometimes even before reaching maturation. 16/ (Watson)

Our concept of goal attainment may not be within the value system of the Zimbabwean since objective study of the pluralistic African cultures brings forth the omnipresent idea of problem solving. A problem can be planned for if significance is noted and alluded to in its presentation. Among the Bantu, sa ngula means a concerted effort to solve a problem such as taking care of less fortunate members in the community, building a house, or other problems that focus the attention of that community's populace. This concept involves emphasis on self-help and community effort which is essential in the solution of environmental problems.

Planning must begin with values as they are inescapable elements of any decision making process. 17/ If we examine the history of health care in Zimbabwe, ad hoc activities were the order of the day as is typical of its westernization. Planning has been elitist, disjointed, and incrementalistic in nature. The practice of "bandaid" health care was initiated in the missionary effort and carried over to the beginnings of the health ministry. It is even prevalent today. Again, what little effort was effectuated in the area of preventive medicine was self-defensive. These efforts exhibited a lack of willingness to regard the problems of the Africans, which

in turn would have an impact upon the entire society. Adenyi-Jones 18/ is in concert with Smith who agrees that the consumer is least often the one listened to in determining priorities regardless of the political system. Those persons with vested interests or who are authoritarian make decisions which are usually political if motivated rather than from the beneficial results. 19/ The fate of the black man was and is still tied to his literal and figurative proximity to the European in Zimbabwe. If he were situated near "settled" areas or engaged in work which was of economic importance, he was more likely to be in a favored position to receive health care in some degree, though usually curative, while preventive care was largely ignored.

Meanwhile traditional healers are playing an important role in the assuaging of symptoms among the rural African population in particular. Not until recent years has any European medical authority admitted that their future role should be carefully analyzed. This is one of the areas which demands further study in the utilization of health manpower.

A needed evaluation in further aspects of the area of health care in this country should be examined in the form of hypotheses which should be tested notably: (1) the lack of respect for African values which has lead to decreased efficiency in cost benefit in terms of resources; (2) Western and European technology is not implemented in context in indige-nous value systems; (3) the aims of the Rhodesian health systems

have been curative rather than preventive, this emphasis being probably due to the preponderance of chronic illness in the white population as opposed to higher incidence of infectious disease and trauma in Blacks; (4) the African orientation toward problem solving is a positive factor in the implementation of new health planning; and, (5) social and political disruption is an opportunity for innovation and change.

LIVING CONDITIONS

The living conditions of people include all of the physical surroundings in which the individual finds himself on a frequent basis. This description deals with the conditions of the place of residence, and the occupational, educational and recreational facilities with which one normally comes in contact. The primary concern of this section is to relate the health status of the people to the conditions in which they exist.

WATER SYSTEMS AND WASTE DISPOSAL

The most important factor of the physical environment that affects the health of the Rhodesian people is the availability of safe water supplies and waste disposal systems.^{20/} Adequate and safe water is a necessity for economic development, and a vital health factor in both urban and rural areas. There are numerous examples that demonstrate the extent to which water-borne diseases can be reduced by supplying safe piped

water to areas where drinking water has formerly been obtained from unsafe sources. In Japan, a survey of several rural areas revealed, that after the installation of safe water supplies, the number of cases of communicable-intestinal diseases was reduced by 71.5%, and that of trachoma by 64%, while the death rate for infants and young children fell by 51.7%. 21/ In Uttar Pradesh, India, after installation of water treatment facilities, the cholera death rate decreased by 74.1%, typhoid fever death rate by 63.3%, dysentery fatality rate by 23.1%, and the diarrheal diseases death rate by 42.7%. Similar experiences in reduction of intestinal disease morbidity rates following water supply development has been observed in Latin America, notably Cuba, Peru, and Colombia. It is reasonable to predict that the enteric disease rate in children could be reduced by 25% to 50% in Rhodesia, if safe water supplies were available.

Disease, attributable to unsafe water supplies, contributes significantly to the mortality and morbidity status of the African population. Waterborne disease is the leading cause of death in children under five (5). It is also a major source of morbidity and mortality in older children and young adults. Cases of all forms of enteric disease were reported for 1975.

This figure is particularly significant in that it refers only to those cases that were severe enough for the victim to seek and find medical care and to warrant the reporting of the

cases by the medical personnel in attendance. The total number of persons who may have suffered from some form of the disease and were prevented from performing jobs, attending school, or caring for the home is unknown, but is believed to be high. 23/ Reduction in morbidity due to water-borne enteric diseases should influence greatly the development of Zimbabwe and the provision for safe drinking water is of prime importance to that end.

The maladies resulting from malnutrition, particularly among the young, correlate with the lack of safe water supplies. Safe water is essential to life. However, unsafe water may serve as a vehicle for the transmission of disease causing organisms. A discussion of the state of nutrition in Rhodesia appears in another section. The problems of secondary malnutrition could be reduced if clean water and sanitary means of excreta disposal were available to the African population. If the incidence of parasitic infestations and enteric infections could be reduced, the nutritional state of the population could be improved remarkably by rational dietary manipulation.

Potable water supplies are available to a large portion of the urban population. Various sources give different figures regarding water supplies in urban areas. Specific studies are needed to determine the locations and capacity of the available water treatment facilities.

The future presents several problems, namely the treatment of water supplies in the major cities of Rhodesia and urban migration.

TREATMENT OF WATER SUPPLIES

The migration of rural Africans to Rhodesian cities is causing rapid expansion of the urban population. Many of these Africans are unskilled and with few resources. This rapid growth has resulted in urban slums with inadequate facilities for providing safe water supplies. Unfortunately the problem is growing.

Safe rural water supplies are still somewhat nonexistent in Rhodesia. The goal of the Ministry of Health is to provide "clean" water supplies to as many people as possible.

SEWAGE TREATMENT

Water disposal facilities in Rhodesia are extremely poor. The problem of unsafe water supplies are multiplied in the situation in which proper sewage treatment is also not available. Large cities and towns, such as Salisbury, Bulawayo, Gatooma and Umtali have waterborne sewers that serve most, but not all residents. In some towns septic tanks are used by Europeans and Asisans, while the Africans use the "bucket system".

Sanitation in the rural areas, does not exist except in many villages where pit latrines are common. The indiscriminate disposal of human waste is not uncommon. Exceptions are to be found among some ethnic groups with religious sanctions against this practice and is a major contributing factor to the

high incidence of schistosomiasis. The future does not augur well for the improvement of these services. For the past several years, most waste disposal projects have been in urban areas. The installation of these facilities should be of highest priority for the health sector. Good water and sewage treatment systems are essential to the economic development of Rhodesia and to the decline of the large number of cases of water-borne disease among the African population.

There is no information available regarding solid waste disposal.

OCCUPATIONAL ENVIRONMENT

The Rhodesian economy is largely oriented to mining and agriculture. The manufacturing of agricultural products is the largest contributor to the country's Gross Domestic Product.

DEMOGRAPHIC PROFILE

GENERAL CHARACTERISTICS

Based on the 1969 census, the population of Rhodesia was 6,204,000, of which 5,900,000 were Africans, 274,000 Europeans, and 30,000 Asians and Coloureds. 24/

It has always been the policy of the Rhodesian government to develop a political, social, and economic climate that would attract Europeans as settlers in this southern African country. An examination of census data with respect to place-of-birth,

citizenship, length-of-residence, and migration reveals how successful the government was in carrying out this policy.

In 1969, 40.5 percent of the white population was native-Rhodesian. It is interesting to note that more than half were under fifteen (15) years of age. Twenty-two and eight tenths percent (22.8%) of the white population in 1969 came from the United Kingdom and 22.8 percent coming from South Africa. Rhodesian citizens born in South Africa comprised 71 percent of the population in 1969, with 65 percent born in the United Kingdom and 48 percent in all other countries. The rate of natural increase of the European population is low, and has decreased considerably over the last twenty years. During 1955-59 the rate of natural increase was 2.0 percent per year; for the period 1970-74 the rate of increase was 1.0 percent.

The growth of the European population, between 1955 and 1960, increased by more than 30 percent, and in 1974 Europeans constituted only 4 percent of the total Rhodesia population.

The Asian and Coloured populations are very small. In 1969, 82 percent of the Asians and Coloured living were native-born. India is the chief external source of Asians emigrating to Rhodesia. Migration of Asians and Coloureds to Rhodesia during the last ten (10) years has been very low, averaging only 137 immigrants per year. In 1974, 95 percent of the Asian and Coloured were Rhodesian citizens.

At present there is no reliable data available regarding the rate of natural increase of the Asian and Coloured populations. Official estimates place the rate of natural increase around 1.6 percent annually.

Of the three (3) ethnic groups in Rhodesia, the African population is the largest. Seventy-seven percent (77%) of African population of Rhodesia comes from the Shona-speaking tribes. The Matabele comprise 17 percent of the African population and thus is the second largest group of indigenous Africans. Alien (foreign-born) Africans comprised 7.5 percent of the population in 1969 and 48.5 percent of this group comes from Malawi, 32.5 percent for Mozambique and 13.0 percent from Zambia.

Migration does not play an important part in the growth of the African population. The decrease in the crude rate (16 per 1,000m 1959) over the last ten (10) years; coupled with early age of marriage; and a natural rate of increase of 3.6 annually over the last twenty (20) years are possible explanations for the rapid growth of the African population. The African population increased from three million to six million during the last twenty (20) years. 25/

URBAN-RURAL DISTRIBUTION

Table One shows the urban-rural distribution of the Rhodesian population. Eighty-five percent (85%) of the European population live in urban areas, compared to 90.2

percent of the total Asians and Coloured population; and only 16.5 percent of the African population. Forty-two percent (42%) of the European population live in Salisbury. While 60.3 percent of the African population live in the tribal trust lands. 26/

TABLE ONE
1969 DISTRIBUTION OF POPULATION BY RACE
AND TYPES OF AREA

	Europeans		Coloureds		Africans		Total	
	No.	%	No.	%	No.	%	No.	%
Urban Areas	194,654	85.3	21,743	90.2	801,760	16.5	1,018,157	20.0
European Rural Areas	31,009	13.6	1,759	7.3	959,880	19.8	992,648	19.5
National Lands	197	0.1	2	-	2,340	0.1	2,539	-
Tribal Trust Lands	2,100	0.9	157	0.6	2,921,840	60.3	2,924,097	57.3
Other African Rural Areas	336	0.1	457	1.9	161,110	3.3	161,903	3.2
Total-Rhodesia	228,296	100.0	24,118	100.0	4,846,930	100.0	5,099,344	100.00

Source: Leistner, G.M.E. (ed.) 1976 Rhodesia: Economic Structure and Change. Chapter 3.

According to Kay, 81.7 percent of the European population reside in fourteen (14) main urban centers, with the greatest concentration being in Salisbury. Salisbury added 27,000 Europeans to its population between 1969 and 1974. 27/

HEALTH STATUS

In the absence of any direct measures of health status, we must limit our consideration to indirect measures of health, namely, mortality, morbidity, the distribution and use of health services.

Health status derived from available mortality data and scant morbidity data is a hazardous task, which can result in misplaced emphasis upon certain diseases and unawareness of important problems not identified within a reporting system. According to MacMahon interpretation of mortality data carries with it certain significant problems.

- (a) It provides only some indication of the under-cause of death with no information about non-fatal or fatal concurrent disease.
- (b) Deaths reported are not necessarily certified by a physician. Such reports are questionable in part because of the deficiency of medical knowledge in diagnosis and because of the influence of medical fads among law and paraprofessional personnel. These death certifications must generally be discounted.
- (c) Most important, mortality data provides little insight into the disease load carried by the live population. 28/

In industrialized societies, the limitations of this data is important because of the increased role of chronic and non-

communicable disease. In Zimbabwe and Manibia, where communicable disease are the primary causes of death among the largest segment of its population, mortality data can be valuable.

MORTALITY EXPERIENCE

Overall, mortality in Africa varies from 8 to 30 per 1,000, a rate that is generally higher than most countries of the world. 29/ These high rates seem to persist in spite of a high birth rate. As a result of this high mortality rate, life expectancy at birth in most of Africa is between 40 and 50 years, as compared to 60 years and over in most industrialized countries. The infant mortality rate in most of Africa is around 150 per 1,000 live births. In most industrialized countries the rate is less than 30 per 1,000 live births. 30/

Deaths reported by cause are usually very incomplete. However, a few countries have death registration services. In most cases these registration services involve those deaths occurring in health facilities, and obviously, does not reflect accurately the overall mortality experience. In spite of this obvious limitation - - most reports of mortality in Africa does reveal the importance of several conditions. 31/ According to a W.H.O. study of mortality in twenty-one (21) African nations, enteritis and diarrheal diseases were the leading causes of death in hospitals. 32/ In addition, acute respiratory infections, measles, malaria, and complications of child-birth were listed among the leading causes of deaths in these

countries. Deaths from various nutritional deficiencies were also listed.

MORTALITY IN ZIMBABWE AND NAMIBIA

Rhodesia is in many ways a transitional society in which the range of extremes are great. The rural areas are characterized by a traditional African social structure with poorly distributed facilities and few available services. This is true particularly for health care and is accompanied by a rather significant disease load especially the acute communicable diseases.

The urban areas are undergoing rapid transition with an influx of rural Africans. Attendant problems are rapid urban growth, the creation of urban slums, a lack of available services such as water, waste disposal, transportation and employment. Health coverage, at least for the extremes of birth and deaths, is generally available although the quality of such coverage varies greatly. Modern sophisticated specialized care exists within the cities of Babawayo and Salisbury. Good general hospitals exist in Fort Victoria, Gatooma, Gevebo, and Marandellas. However, the availability of such services to large segments of the African population is certainly open to question.

A review of the leading causes of death reemphasizes the impact of segregation in Rhodesian society. Among white Rhodesians the leading cause of death in 1975 were, arteriosclerotic and

degenerative heart disease, malignancies, motor vehicle accidents, and vascular lesions of the central nervous system. The causes of death indicate the relatively advanced standard of living of many white Rhodesians and demonstrate sufficient longevity to allow for the development and manifestation of these chronic diseases.

Among Africans the leading causes of death were: pneumonia, measles, ill-defined infant diseases, avitaminoses and other dietary deficiencies, gastroenteritis, colitis, tetanus, tuberculosis, and motor vehicle accidents. Perhaps more useful is the analysis of death in specific age ranges.

1. Infant deaths (Table 2): Of the deaths occurring during early childhood various forms of perinatal mortality ranked first. Followed by deaths from pneumonia, anoxia and hypoxic conditions, while deaths from enteritis tetanus, and birth injury ranked fourth, fifth and sixth respectively.
2. Ages 1-4 years: Of the death in this age category, approximately (50%) are attributed to communicable diseases notably measles, gastritis-enteritis, pneumonia and tuberculosis. The effects of these diseases are exaggerated by malnutrition prevalent in the African population in this age group. 33/ Furthermore, it is obvious that, at least technically, a small percentage of deaths in this age group are attributable to preventable diseases could have been

averted by safe water supplies, accessible medical care and a reasonable state of nutrition.

3. Ages 5-14: This is the age in which the society makes a major investment in terms of education. Diseases take their toll here in deaths representing a major loss of life in young adults and consequently a lost investment. Insofar as causes of death reflect illness suffered in the surviving population, these diseases impose burdens which hinder normal growth and development by the African population. Again, communicable diseases contribute to a large proportion of deaths, with pneumonia, and tuberculosis high on the list. (Enteritis as a leading cause of death in this age group gives some insight into the importance of intestinal and parasitic disease that might be prevented through effective environmental sanitation and personal hygiene. The large role played by diseases for which immunization is available reflects the currently inadequate coverage of the African population by immunization services, and the margin by which deaths might have been averted in this age range.
4. Ages 15-44: In this age group, deliveries and complications of pregnancy are major problems, relating directly to the maldistribution of medical care, especially in the rural African population, in which a large percentage of the deliveries have no professional attendance.

TABLE TWO

Leading causes of Infant Mortality Among the African Population, 1975

Causes of Deaths	Male	Female	Total
Perinatal Morbidity and Mortality	353	318	671
Pneumonia	253	240	493
Anoxia and Hypoxic Conditions	198	171	369
Enteritis - other diarrheal diseases	159	120	279
Tetanus	128	122	250
Birth Injury and difficult Labor	137	98	235
All Other Causes	429	376	805
TOTALS	1,657	1,445	3,102

Source: Secretary of Health's Report - December, 1975

Tuberculosis is a leading cause of death in this age group and to a great extent this disease can be prevented and treated.

Accidents are a significant cause of mortality in this working age population. Mortality from other violent causes, including homicide and suicide is of major concern in both African and European populations. To a significant extent these are consequences of the urbanization process.

5. Ages 45-64: As discussed previously, heart disease, cancer, stroke, and accidents become the leading causes of death. Tuberculosis, pneumonia, and enteritis are still significant causes among the African population in this age group. Here the burden of care rests primarily upon the resources of the health care system, and practical preventive techniques, e.g., better nutrition, parasite control, tuberculosis control, will influence the outcome of a small percentage of deaths in this age group, maybe (10%).
6. Ages 65 and over: It is reasonable to expect that the disease patterns for this age range are essentially the same as in the above groups.

MORBIDITY DATA

Inadequate incidence and prevalence data understate the true disease load. But with the available data some insights can be provided into the disease patterns observed within the medical care system. Table three, presents cases of selected communicable diseases for the year 1975. Similar data is reported for 1975 in the Rhodesian Secretary of Health's report. This data shows the selected diseases for which the population will be at considerable risk. In Rhodesia the reporting of prevalence is not uniform and hence the information is open to misinterpretation. It is also important to observe that reported cases of selected lethal diseases do not even equal the total number of deaths, e.g. for tetanus in 1975 there were reported 22 cases, but 262 deaths. 35/ However, some very useful preliminary conclusions can be developed using the reported case data presented in Table three.

1. Reported cases of malaria numbered 9,698 in the African population, while the European and Asian population reported 89 and 3 cases, respectively. The age distribution of malaria is relatively uniform after the first birthday anniversary with a tapering off of reported cases after the fifteenth birthday. This decrease probably represents considerable underreporting within the adult population prior to intensification of the malaria eradication program. This has certainly been true in several other countries in Africa and South America. 36/

TABLE THREE

Leading causes of notifiable Infectious Disease Among the African Population, 1975.

<u>Diseases</u>	<u>Cases</u>	<u>Deaths</u>
Pulmonary Tuberculosis	3,198	315
Non-pulmonary tuberculosis	480	25
Trachoma	8,659	-
Infectious hepatitis	325	1
Leprosy	364	4
Malaria	9,698	8
Cholera	546	27
Bubonic Plague	66	9

Source: Secretary of Health's Report - December, 1975

2. There were 8,659 cases of trachoma reported in the African population during 1975. While no cases were reported for European and Asian populations.
3. Although tuberculosis occurs in all age ranges, it is a particularly important problem in children and infants under five in most developing countries. This age group accounts for almost twenty percent (20%) of reported cases in some of the developing countries. During 1975, 3,198 cases, resulting in 315 deaths, occurred in the African population.
4. Cholera appears to be on the increase in Rhodesia. Increases in reported cases have been observed in the Manicaland Province during 1975. Extensive efforts have been underway over the past five years in attempts to control the disease. In spite of these efforts cholera has become endemic in several areas. Five hundred forty six cases, and twenty-seven deaths were reported in 1975. 38/
5. Plague has also been reported in Rhodesia. Sixty one cases occurred during the last twelve (12) months. Fatalities resulted in twenty-six percent (26%) of these cases. 39/

MORBIDITY DATA FROM HOSPITALIZATIONS

Data on hospitalizations were obtained from the Secretary's report for December, 1975. Some of the most frequent causes

of hospitalization are conditions related to preventable disease; malnutrition, neo-natal tetanus and tuberculosis.

NUTRITION: VALUE OF THE DIET

In 1976, corn was the principal food item of both the Shona and Ndebele. Sorghum, millet and lesser amounts of ground nuts, and beans make up the remainder of the average diet. In 1965, these staples were available on a per capita per day basis at the levels listed on the following table:

TABLE I

<u>Item</u>	<u>Amount (G)</u>	<u>Calories</u>	<u>Approximately Protein Value or Content</u>
Corn	300	399	30
Millet & Sorghum	113	400	12
Ground Nuts (Roasted)	60	360	13.9
Beans	2	-	-
Totals	475	1,099	55.9

Other foods that contribute to the daily diet cannot be adequately estimated, however, it has been reported that cereals and other carbohydrate foods account for approximately 75% of the caloric equivalent of the diet for most equivalent of the diet for most Zimbabwean Blacks.

Milk and milk products do not constitute a normal part of the diet for most of the African population. Milk along with meat is looked upon as a special food for important occasions, especially among the less prosperous rural people. Though cattle raising is common in rural areas, the practice of eating beef is rare and the cattle are maintained as a sign of status, only to be slaughtered for consumption on important ceremonial occasions. Other domestic animals are also raised, but the meat intake is nonetheless small. In the urban areas where cash is more readily available and meat is obtained from a butcher rather than from ones' herd, the eating of meat is more common.

Because eggs are thought to cause sterility, they are seldom eaten in the more rural areas. But, the abstinence from their consumption is declining in the urban areas. Urban Blacks consume less corn and more vegetables, but still have not widely accepted the consumption of wheat. Wild fruits, sweet potatoes and honey also contribute to the diet. The supply of fish is not abundant. No adequate statistical information has been produced on the level of nutrition of the rural population. It is reasonable to assume, that on the average the urban family with regular income is somewhat better nourished than its rural counterpart. To support this notion, a 1967-68 report from a Harare Hospital can be cited which indicated that patients with disease resulting from

inadequate nutrition most often came from rural villages, less frequently from private white farms and the smallest number came from urban areas.

Somewhat more adequate information is available on the urban population and a 1964 study in Salisbury is shown in the following table (Table 2). "Man unit" is a reference standard calculated by the Provincial Medical Officer of Health for a man 25 years of age, healthy and physically fit for active work. He weighs 60 kg., lives at a temperature of 20 degrees C., neither gains nor loses weight on a well balanced diet. On each working day he is employed in an occupation which is not sedentary, but does not involve more than an occasional period of hard physical labor. When not at work, he is sedentary about four (4) hours daily and may walk for up to one and one-half hours. He spends one and one-half hours on active recreation and household work.

The survey included 500 families and covered one full year. Families with income over \$112 per month were eliminated from the sample. There was a total of 3, 205 people (1,235 adults; 1,970 children) in the 500 homes. The monthly income of 96% of the families was between \$32.90 and \$51.52 and over 97% of the heads of households were employed at occupations ranging from clerks to laborers.

The average amount spent for food is 54.4% of the average monthly income (see Table 3) with an average of 63% of that amount being spent on bread, cornmeal (cereals and meats)

(Table 4). The meat and fish purchased was fresh. The most popular beverages were tea and beer. The proportions spent for each food stuff does not vary significantly with income. What does of course vary is the amount. In 1964 the higher income level of this group bought on the average 3.3 kilos of meat per month, while those at the lower level bought 1 liter of milk per day while a lower level bought 1/2 liter.

On analysis of this information, it can be seen that even at the highest income level, "the man 25 years of age" is below the recommended calorie level set by the government by 441 calories and by that set by the World Health Organization by 581 calories. While the protein intake is in the range acceptable by the government and above the "safe level of protein intake" established by W.H.O., it is markedly lower when compared with the white population. All groups suffer from inadequate intake of Vitamin A, riboflavin, niacin and ascorbic acid and all but one group has low calcium intake. Another similar survey was made in Umtali, an industrial and commercial town. The results of that work are given in Tables 5 and 6. The trend is similar to that of the Salisbury study.

In analyzing these data, one must bear in mind that the Black worker may be more active than the standard of comparison and thus may require from 500 to 1,000 calories per day more. The developing adolescent will also require a larger caloric intake than allowed for the "moderately active" man.

Consideration must also be given to the added protein and caloric requirements of the pregnant and breast feeding woman in whom the protein requirement may be as much as 37% above the non-pregnant average during lactation. Traditionally, babies are breast fed from 48 to 96 months and then abruptly given adult food. In some areas, the breast feeding of the child has been shortened to 12 and 16 months. In either case, an adequate protein and calorie intake must be insured for the child.

MALNUTRITION: THE SCOPE OF THE PROBLEM

(1) The number of Black Zimbabweans who suffer from specific deficiency diseases or from severe to moderate protein caloric malnutrition is not known. Information on the nutritional state of the Black population, always inadequate, has been nearly nonexistent since 1965. Nevertheless, malnutrition is considered to be a major health factor contributing heavily to an increased incidence of mental and physical retardation, and increased susceptibility to infectious diseases such as measles and pneumonia with their accompanying complications.

In 1960, a survey of school children showed 25% of the Black students to be malnourished as compared to 6% of the white children. In 1964 investigation showed that 76, 39, 27, 30 and 23% of Black children under the age of six (6) years admitted to hospitals and five (5) respective areas of the country with the diagnosis of measles were under weight when

plotted on a standard American weight for age chart. Mortality due to measles is greater and recovery prolonged among the malnourished. In 1972, Norton and Chaibra examined the serum of 207 children from Epworth, an urban area, and 22 children from near Mtoko, a rural area, and found that 46% of the former and 86% of the latter had inadequate protein intake by their method. The children are in ages of 8-10 and primary intake by their method. The children are in ages of 8-10 and primary school students.

McMannus in 1968, reported 98 cases of the Vitamin "deficiency disease Xerophthalmia in Matebeleland and estimated a prevalence of about 250 cases. Six (6) of his cases also had symptoms of protein calorie malnutrition. Goiter is also widespread in Zimbabwe with prevalent figures varying from 35 to 80% in various areas of the country. Low soil iodine concentration is considered to be the major contributing factor to endemic goiter with some researchers contending that the eating of rape leaves, which contain a goitrogen (vinyl thio-arazolidine), is an additional factor." There is also wide spread ribo-flavin, niacin, ascorbate and calcium deficiency among adults as well as in children.

SCOPE OF PROBLEM

The principal nutritional problems of the African population are caused by (1) lack of adequate caloric intake,

(2) inadequate protein consumption, (especially in the rural areas), (3) inadequacy of fresh vegetables and fruit consumption, (4) seasonal nature of diet, and (5) poor soil iodine levels.

In Zimbabwe, 75% or more of the diet is cereal and other carbohydrates. Of this amount, corn is the principal constituent. It is a food low in protein content and more important, low in the essential amino acids, tryptophane and lysine. Sorghum and millet are the other major cereals in the diet. These two do not provide adequate protein, though millet does contain tryptophane. In the final analysis, a cereal diet is not an adequate source of protein for developing children or active adults. In addition, the vitamins niacin, riboflavin, ascorbic acid and vitamin A are low or absent. Niacin, Riboflavin and Vitamin A are best obtained from liver, red meat, wheat germ, milk products, eggs and fish which also are excellent sources of protein. Ascorbate is plentiful in fruits, especially citrus, leafy vegetables, tomatoes, tubers and most grasses. Although the amount of calcium required is subject to controversy, it is clear that this is an essential mineral. It is found in dairy products, soy beans, eggs and many green vegetables. Iodine can best be supplied by the use of iodized salt. The consumption of goitrogens is to be discouraged as they increase the iodine requirement.

QUANTITIES OF SELECTED FOODSTUFFS CONSUMED EACH MONTH
PER MAN UNIT - SALISBURY (RHODESIA) 1964

NUTRIENT VALUES OF FOOD PURCHASED AND PRESUMABLY CONSUMED PER MAN UNIT*
IN EACH OF FIVE INCOME GROUPS

Nutrient	Rec. Allowance per Man Unit*	AMI** \$32.90	AMI \$42.98	INCOME AMI \$51.52	AMI \$61.32	AMI \$79.66
Calories	2,860	2,199	2,331	2,543	2,579	2,419
Proteins (gm)	65-85	68	73	80	82	77
Fat (gm)		37	39	44	46	44
Calcium (mg)	400-500	300	306	352	436	380
Iron (mg)		24	24	26	26	24
Vitamin A (I.U.)	4,000	2,963	2,771	2,875	3,334	3,116
Thiamin (mg)	1.25	1.94	2.00	2.16	2.14	1.97
Niacin (mg)	19	12	13	15	15	14
Riboflavin (mg)	1.6	0.9	1.0	1.1	1.1	1.1
Ascorbic Acid (mg)	40	30	31	33	38	37

*The reference "man unit" was previously defined on p. 263 in terms of weight, climate, and physical occupation.

** Average Monthly Income

Source: Government of Rhodesia, Report on Urban African Budget Survey in Salisbury, 1963/64

TABLE 3

PROPORTIONAL EXPENDITURE ON ALL BUDGETARY ITEMS - SALISBURY, 1963 - 64

Item	AMI* \$32.90	AMI \$42.98	AMI \$51.52	AMI \$61.32	AMI \$79.66
	%	%	%	%	%
Food	61.2	58.5	55.1	52.6	44.7
Drink	1.9	2.4	3.1	3.1	3.9
Tobacco	1.1	1.2	1.1	0.9	0.8
Clothing & Footwear	4.6	6.5	8.8	9.3	9.9
Fuel & Light	5.2	4.8	4.4	3.9	3.0
Household	2.9	2.9	3.6	4.8	6.8
Personal care and health	1.1	0.9	1.1	1.1	1.5
Transportation	2.3	3.2	3.7	4.4	9.2
Recreation	0.1	0.1	0.1	0.3	0.4
Miscellaneous	1.9	2.9	4.1	4.6	8.1
Rent	17.7	16.6	14.9	15.0	11.7

* Average Monthly Income

Source: Government of Rhodesia, Report on Urban African Budget Survey in Salisbury, 1963/64

TABLE 4

PROPORTIONAL EXPENDITURE ON FOODSTUFFS - SALISBURY (RHODESIA), 1965

Food Item	AMI* \$32.90	AMI \$42.98	AMI \$51.52	AMI \$61.32	AMI \$79.66
	%	%	%	%	%
Bread	20.5	20.0	19.6	19.3	18.0
Mealie meal**	16.5	16.0	14.9	14.7	13.4
Other Cereals	1.6	1.4	1.8	1.8	2.4
Meat	25.9	26.9	27.0	25.0	26.6
Fish	3.4	2.9	2.8	3.4	2.7
Milk	5.1	4.5	5.0	5.9	6.2
Cheese & eggs	0.4	0.2	0.8	1.1	0.8
Oils & Fats	4.0	3.8	4.0	4.3	9.1
Vegetables & Fruits	8.4	7.9	7.9	8.7	9.1
Sugar	10.2	10.5	10.0	10.1	9.4
Beverages	2.4	2.8	2.8	2.7	2.5
Other Foods	1.6	3.1	3.4	3.0	4.6

* Average Monthly Income

** See Footnote, page 262

Source: Government of Rhodesia, Report on Urban African Budget Survey in Salisbury, 1963/64

TABLE 5
 RELATIVE EXPENDITURE BUDGETS OF UNRATIONAL FAMILIES
 IN RENTED ACCOMODATIONS - UMTALI (RHODESIA), 1963/64
 (Expressed in Percentages)

Item of Expenditure	AMI* \$27.44	AMI \$34.52	AMI \$39.76	AMI \$50.26	AMI \$63.00.
Foodstuffs	66.0	58.8	57.9	57.3	52.1
Beverage & tobacco	2.3	2.7	4.0	5.2	5.1
Clothing & Footwear	5.4	10.3	10.3	11.5	13.4
Rent	13.8	12.8	10.4	8.7	7.4
Fuel & Light	3.1	3.8	2.2	3.4	3.1
Household	4.3	3.8	6.6	6.1	6.3
Personal Care & Health	.7	.8	.9	1.3	1.6
Transportation	1.7	2.6	4.0	3.4	5.0

* Average Monthly Income

Source: Government of Rhodesia, Report on the Urban African Budget Survey in Umtali, 1963

TABLE 6

NUTRIENT VALUE OF FOOD PURCHASED AND PRESUMED CONSUMED
PER MAN UNIT * IN EACH OF FIVE INCOME GROUPS - UMTALI (RHODESIA, 1963)

NUTRIENT	AMI** \$27.44	AMI \$34.52	AMI \$39.76	AMI \$50.26	AMI \$63.00
Calories	2,347	2,500	2,683	2,672	2,713
Protein (gm)	72	76	82	81	85
Fat (gm)	38	39	42	41	46
Calcium (mg)	412	456	507	486	550
Iron (mg)	26	29	30	29	30
Vitamin A (mg)	3,065	3,405	4,152	3,088	3,661
Thiamin (mg)	2.2	2.3	2.4	2.4	2.4
Riboflavin (mg)	0.9	1.0	1.1	1.0	1.1
Niacin (mg)	12	13	14	14	14
Ascorbic Acid (mg)	48	51	61	47	60

*See Definition of Man Unit p. 263 and recommended allowance on Table 10.

** Average Monthly Income

Source: Government of Rhodesia, Report on Urban African Budget Survey in Umtali, 1963.

TABLE 7
PLANTING AND HARVESTING SEASONS - Rhodesia

COMMODITY	PLANTING SEASON	HARVESTING SEASON
Tea (eastern mountain region)	September-November	December-May
Barley	May	September-October
Corn	November-December	April-June
Millet	November-December	April-June
Oats	November-December	April-June
Rice	October-November	April-June
Rye	April	September-October
Sorghum	November-December	April-May
Wheat:		
Summer	December	April-May
Winter	April-May	October-November
Cotton	October-November	April-May
Kenaf	October-November	April-May
Bananas 1		March-August
Citrus Fruits:		
Transplanted	February or July	May-November
Deciduous Fruits	February	February-April
Tropical Fruits	February or July	January-May
Castor Beans	November-December	March-April
Groundnuts 2	December	April-May
Sunflower Seed	December	April
Sugarcane	December-January	September-May 3
Tobacco:		
Flue-cured (main type)	October-December	January-April
Turkish	January-February	March-July
Other types	October-December	January-April
Beans 4	November	May
Green Beans 4	January-February	April
Peas, dried 4	January	April
Green peas 4	December	March
Potatoes, Irish: 4		
Summer	November-December	May-July
Winter	April-May	September-November

Table 7 Continued

COMMODITY	PLANTING SEASON	HARVESTING SEASON
Sweet Potatoes 4	November-December	April-May
Onions 4	March-May	September-November
Tomatoes 4	April-May	August-October
Fresh Vegetables: 4		
Summer	September-December	December-May
Winter	February-April	May-August

1. Orange trees bloom between August 20 and September 15 and produce fruit which is harvested from April 1.
2. Dwarf early maturing types should be planted in January.
3. Harvested from 12 to 18 months after planting.
4. These are the main planting and harvesting periods for vegetables which, however, is grown all year round, depending on varieties and irrigation.

Source: U.S. Department of Agriculture, Planting and Harvesting Seasons for Africa and West Asia.

CONCLUSIONS:

There is no answer to the problem of protein calorie deficiency other than an adequate diet. There are no substitutes. In order to combat protein calorie malnutrition Blacks in Zimbabwe must (1) have a diet of higher caloric content, (2) reduce the proportion of calories provided by cereal and increase that provided by meats, eggs, and dairy products, (3) be encouraged to diversify the diet which should include wheat and wheat products, (4) be encouraged to plant gardens and increase the consumption of green vegetables and fruits, (5) be encouraged to consider formally taboo foods such as eggs and goats' milk as food sources, (6) be encouraged to plant and consume crops which have high nutritional value and provide both winter and spring harvest, (7) be discouraged from chewing rape leaves, and (8) be provided with an active farm extension service from the government. None of this can be accomplished, of course, under the present regime. An orderly transition would be best from a nutritional point of view. The recommendations would be the same in the event of a revolutionary situation but it would take longer to effectuate the necessary changes in order to ameliorate the problem of malnutrition.

PRESENT SYSTEM OF HEALTH SERVICES

The Public Health Act of 1924, passed by the newly constituted Southern Rhodesian Legislative Assembly, marked the beginning of an effort on the part of the Government to provide public health and preventive medical services to the people of Rhodesia. 1/ Although the Central government has only statutory obligations and functions in the field of preventive medicine, it has found itself in the role of the main provider of hospital services. 2/ Medical care provided by missions, although an important component of the health services system in other parts of Africa, have played a lesser role in Rhodesia. However, a notable feature of the medical history of Rhodesia is the degree to which the large mining companies involved themselves in the provision of medical care services for employees and their dependents. 3/

THE MINISTRY OF HEALTH

FUNCTIONS

The responsibility for the administration of health services rests with the Minister of Health. The functions of the Ministry are:

1. To control epidemic and endemic disease and to establish and maintain the services for the prevention of illness, the promotion of health by all available means, including education of the public of all races, and the provision of advisory and supervisory medical and dental health services for schools.

2. To coordinate and support when necessary and desirable, health services provided by other agencies, such as local authorities, missions, etc., and to make such contractual arrangements as may be necessary for the rational use of services provided by industry and other private enterprise.
3. To provide medical care services for the population of all races, not otherwise provided for, and in particular, to provide specialized hospital facilities beyond the fiscal means of other public or private agencies. (It should be noted that this is not a statutory obligation but merely an accepted function inherited from the day of the 'Chartered Company').
4. To provide clinical teaching facilities for undergraduate and post-graduate instruction of medical practitioners and to provide and supervise training facilities for nurses, auxiliaries and technologists in the various para-medical professions which are required to staff a health service.
5. To conduct and to encourage research into medical and public health problems, particularly those related to endemic and nutritional disease. 4/

STATUTORY BODIES AND LEGISLATIVE ACTS

To assist the Ministry of Health in meeting its major functions, as outlined above, several statutory bodies have been established by the legislature. These are as follows:

- a. The Medical Council of Rhodesia. The Medical Council was established under the Medical, Dental and Allied Professions Act. Its responsibilities are to (1) register suitably qualified members of the medical and dental and allied professions; (2) to maintain disciplinary control of these professions; and (3) to monitor and set standards for supervising staffing, facilities and curricula of establishments engaged in training candidates for which the Council is responsible for registering.

- b. The Advisory Board of Public Health. The Advisory Board, established under the Public Health Act, serves to advise the Minister on all matters pertaining to public health and health services.
- c. The Atmospheric Pollution Advisory Board. This Board established under the Atmospheric Pollution Prevention Act. Its function are to monitor air standards.
- d. The Drug Control Council. The Dangerous Drugs Act and the Pharmacy and Poisons Act were replaced with the Drug Control Act which established the Drug Control Council. The function of the Council is to monitor, register and control the manufacture, import and distribution of all human and veterinary medicines.
- e. The Hazardous Substance Control Board. Established under the Hazardous Substances Act, this Board is responsible for the control of the manufacture, storage, importation and distribution of all substances which by virtue of toxicity, radioactivity, etc. are actually or potentially dangerous to human or animal health.
- f. The Medical Research Council. This Council was created as a result of passage of the Research Act. The responsibilities of the Council are to obtain and distribute funds for research into health problems and to obtain funds for the establishment and administration of research institutes. 5/

The Food and Food Standards Act, administered directly by the Ministry of Health, empowers the Minister to control the quality and prevent the adulteration of all articles of food and and drink. In addition, it empowers the Minister to prescribe limits of tolerance for deliberate additives or accidental contaminants in food substances.

ORGANIZATION OF THE MINISTRY OF HEALTH

An abbreviated organizational chart showing the main structure of the Ministry of Health is given in Figure 1.

Functional and organizational responsibilities for the subdivisions below that of the Deputy Secretary were not found in the literature.

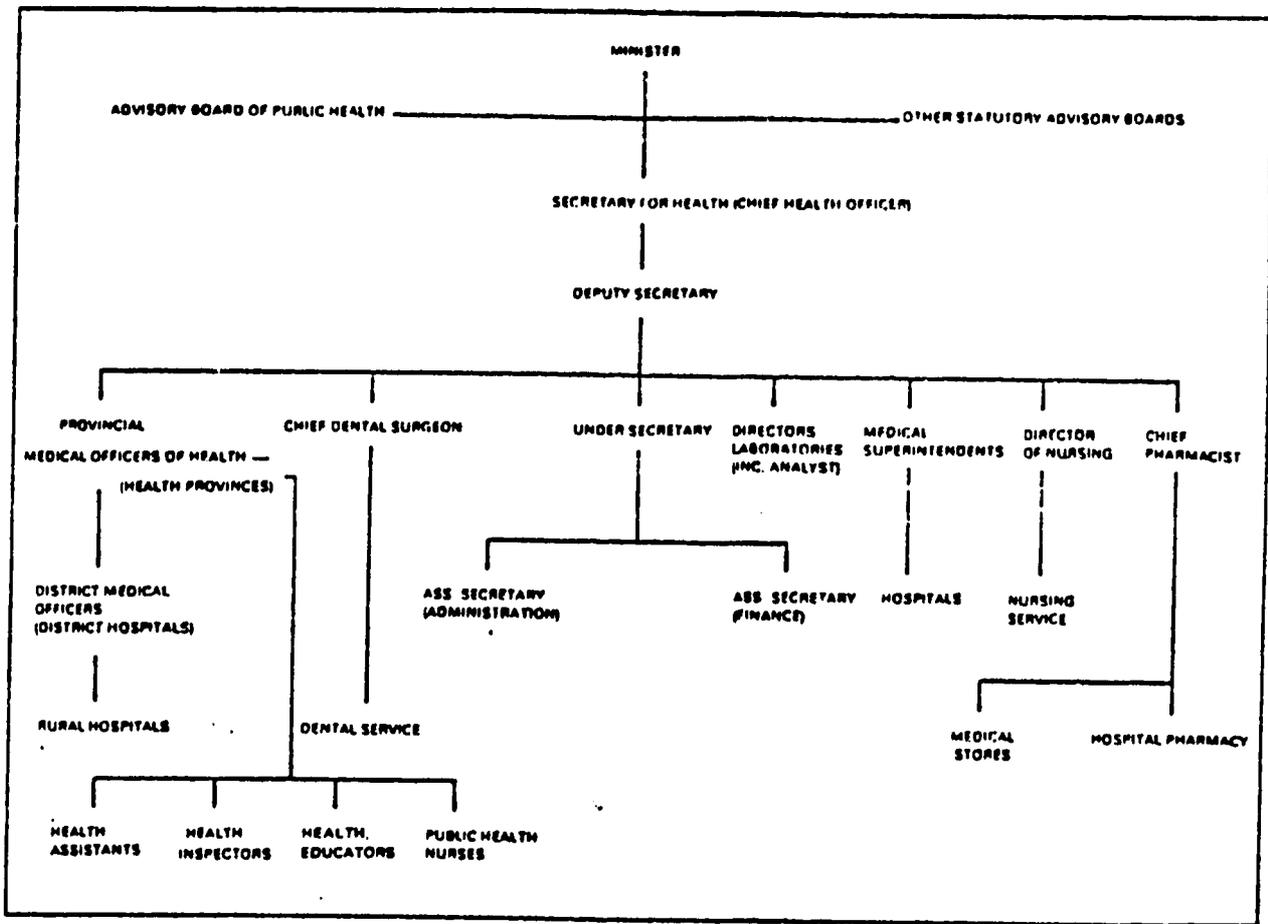


Fig. 1 Main Structure of Ministry of Health

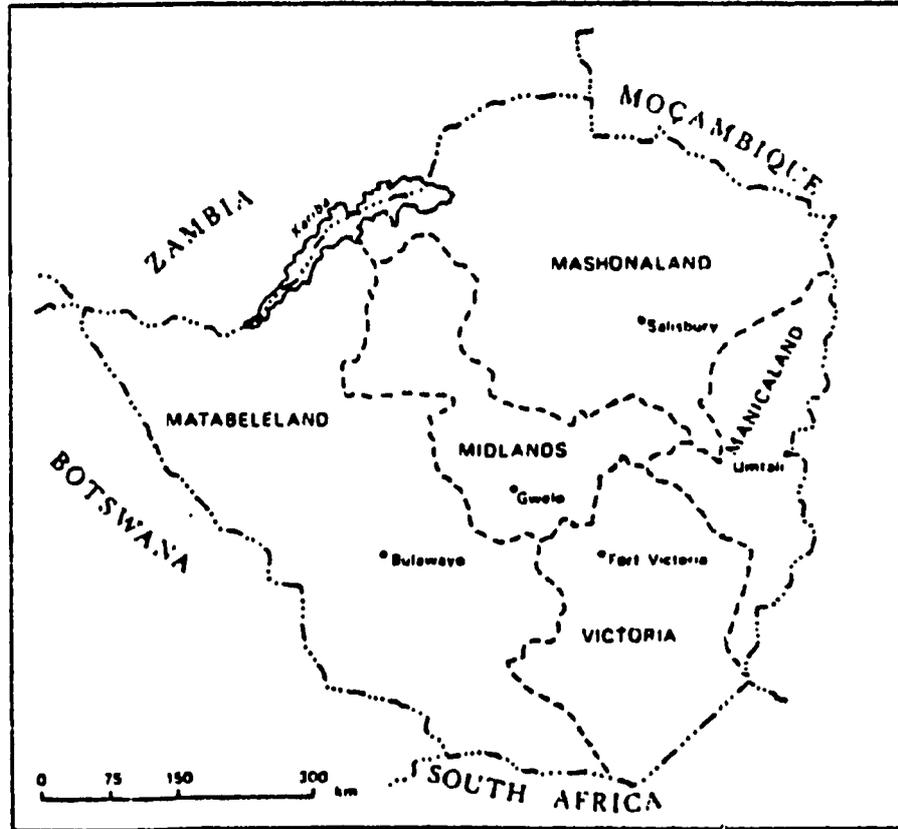


Fig. 2

Health Provinces

THE DELIVERY OF HEALTH SERVICES

PREVENTIVE SERVICES

All of the major structural components (agencies) of the Rhodesian Health Services System cooperate to some degree in the delivery of personal and environmental preventive health services. These agencies are the Ministry, the local authorities, mission hospitals, voluntary organizations, industrial clinics, and private practitioners.

The major municipalities have their own public health departments. However, outside the major urban areas, the preventive services are supervised and coordinated by the Provincial Medical Officers of Health for each of the five (5) provinces. Both the public health departments and the Provincial Medical Officers utilize the following personnel in the provision of medical services to their respective target populations: health inspectors, public health nurses, auxiliary staff, health educators and health assistants.

The types of personal preventive health activities which are conducted are: inoculations against communicable diseases, distribution of prophylactic or suppressive drugs, ante-natal care, post-natal and infant care, family planning clinics, food distribution programs to the needy, periodic medical and dental inspection of school children and health education programs in home hygiene and home economics. The extent to which these services are available and/or utilized, the major ethnic groups which are targeted to receive these services, and a

measure of the degree to which these services impact the population was not available in the literature reviewed.

The environment preventive health services is usually the responsibility of the local council or authority. They have been concerned mainly with the control of malaria and schistosomiasis. Because of cultural, social and economical reasons, these programs have not been very effective. The development of safer rural community water supplies has been almost nonexistent, purportedly for economic reasons.

COMPARATIVE ANALYSIS

A comparison of the health delivery systems in certain underdeveloped countries of the world sheds light on inherent problems of European-imposed systems. The colonialism manifested itself in various forms in Africa. At one end of the spectrum is the almost total assimilation of the Europeans into the indigenous population by intermarriage and merger of cultures as can be seen in Cuba and Latin America. On the other end, we see colonialism in its most extreme form, Apartheid, as is practiced in Southern Africa by the Boer and English Europeans. This form calls for separation of the races on every level except where there is a clear-cut master-slave relationship.

As is to be expected the attitudes and prejudices of the European rules have dictated the course and amount of development to be found in these various countries over the past 200-300 years. This can be seen in comparing the economic, educational health and other criteria of development that are commonly used. The standards of living were obviously higher in the European countries of origin than they were in the lands to which the colonizers migrated. The gap between the colonies and the indigenous population is even greater by any material criteria.

A look at the health delivery systems of various colonized territories is a very good example of the systematic exclusion

of indigenous people from the benefits of their labor in their lands. It is also beneficial to look at and compare changes that were made when some of these countries became independent and began to project goals for themselves.

It is therefore useful to look at nations that have gone through an era of colonization and transition and see what changes have occurred in the health delivery systems.

Examinations will be made of the health systems of Mozambique and Angola as examples of such territories with similar health problems based on their colonial systems. Cuba will also be studied as an example of a nation that has undergone revolutionary changes in its political and health systems.

"Health is a state of complete physical, mental and social well being and not merely the absence of disease or infirmity..." 1/

The World Health Organization's definition of health goes beyond the simple maintenance of life, but speaks to the issue of health being a means of improving the quality of life as well. In examining the health care delivery systems of various countries it is important to ask if the system puts forth an effort to improve the quality of life.

For example, Mozambique, the former Portuguese colony in South-Eastern Africa is a country of over 303,000 square miles and a population estimated at about 7.5 million in 1970. 2/ Of this 7.5 million people 97.7% were African and only 1.4% European. The remainder of the population is East Indian 0.3%;

Children 0.3%; Mixed 0.5%. This is a typical ratio of indigenous population to colonizers to be found in the African continent.

Life expectancy at birth in Mozambique for the Africans population is 25 to 33 years. This is with an infant mortality rate of 33%. It is estimated that the life expectancy of the white population is 1/2 to 1 times as long. The infant mortality rate is at least 1/2 that of the African population. 3/

The main health problems in the Africans are malnutrition, malaria, sleeping sickness, bilharziasis, leprosy, helminthiasis, and hepatitis.

Only Europeans, and urban westernized Africans have electricity, sanitation, and health facilities available to them.

In the towns the Africans, especially, lack modern sanitation and water supply. At least the rural Africans live where water is plentiful, even if sanitation and disposal facilities are almost nonexistent. The urban Black also lives in far more crowded conditions, although his standard of living is considered higher than rural counterpart. This is to say that the urban African lives on more than subsistence budget and is able to purchase European goods. 4/

A survey made in 1967 by the Portuguese government and the World Health Organization showed that medical facilities in Mozambique were the responsibility of the government, large private enterprises and the labor syndicates. These were all

white controlled and operated organizations setup principally for the welfare of Europeans. Any benefits Blacks received were usually due to proximity. 5/

"Trained medical personnel and medical facilities were located primarily in urban areas. many of these were manned by visiting nurses and physicians rather than a permanent staff." 6/

The government supervised its medical facilities through the Public Health Service of the Secretariat for Health, Labor and Welfare. The country was divided into four (4) health regions and nine (9) health districts. The nine (9) health districts coincide with the administrative districts in Mozambique.

All health facilities are coordinated around three (3) central hospitals. They are located in the cities of Lowenjo, Marguls, Beira and Nampula which served the twelve (12) regional hospitals and eighty-two (82) delegations. The latter consisted of a hospital or infirmary with their out-lying first aid stations, three (3) leper asylums, four (4) leper villages, eight (8) hospitals for sleeping sickness and one hundred seventy nine (179) maternity homes. 7/

The center of medicine in the entire is the Miguel Bomborder Hospital in Lourenzo Margues. It is the largest and most modern facility in the country having over 1,000 beds. It is also the teaching hospital for the medical school.

In 1967 there was a total of about 11,200 hospital beds in the country. This was an average of one (1) bed in every 600 people.

There was a definite shortage of medical personnel, particularly in the rural areas. As has been stated previously, the most rural stations were manned by nurses and auxiliary personnel. The Portuguese government created the Faculty of Medicine at the University of General Studies. This school did not offer a degree in medicine. To earn the M.D. degree a student had to continue to study in Portugal. There were a few students in South Africa. In general, the nation depended on doctors to come from Portugal to settle, but Portugal was itself facing a shortage of personnel.

There were 411 doctors in Mozambique in 1967. This is one (1) doctor per every (1,700) persons. Two-thirds (2/3) of this total were in the districts of Lourenco Marques and Manica e Sofala. Most of the physicians worked for the state and about one-fourth (1/4) were in private practice. The country also had about 1,258 nurses, mostly male. One thousand fifty three (1,053) were employed by the government. 8/

The attached map shows, quite graphically, the distribution of the hospitals and hospital like facilities run by the government. It points to the vacinity of medical facilities in the out lying regions. There is obviously a concentration of hospitals and clinics along the coast.

All other medical aid is in the hands of industry and missions either through the corporations themselves or through the labor unions. The missions employed eighteen (18) doctors and seventy-two (72) nurses in 1967, to operate seven (7) hospitals and one hundred forty one (141) other medical institutions in the country. 9/

Under the labor code, corporations with greater than 100 employees were responsible for the health care of their employees and families. Smaller companies pay the government to assume this responsibility. In 1965, industrial and agricultural enterprises maintained a total of twenty-four (24) hospitals, twenty-one (21) infirmaries and three hundred forty two (342) first-aid stations, of which all but thirty one (31) offered only rudimentary medical care. The largest firm in Mozambique in terms of employees, the Sena Sugar Estates, Lt., with over 10,000 employees, operated four (4) hospitals as well as dispensaries and first-aid stations. 10/

The numbers begin to sound incredulous when one thinks of four hundred eleven (411) doctors covering an area of over 300,000 square miles and a population over 7 million.

Since independence from Portugal, problems have become worse. As was stated before, the entire health care system was created and devoted to delivering aid to the European population. It is interesting to see what happened after the armed conflict between blacks and whites for control of the land and its resources. Unfortunately, information on Mozambique, Angola and Guinea is difficult to obtain, but one article in

February, 1975 sums up the situation quite well.

Newly independent Mozambique, a former colony of Portugal, has decided to implement a socialized medical program under its new Marxist regime. The Minister of Health, Dr. Antonio Paulenon, announced that only one hundred fifty (150) doctors are in active practice in the country, constituting a doctor/population ration of less than 1:60,000. Supposedly, there is only one native born physician in the one hundred fifty (150). Through the Frelimo organization of the leftist liberation movements, Dr. Paulenon has invited volunteer physicians from abroad to come in and help the country. Mozambique needs at least 600-700 doctors. Even with the additional medical manpower, the country's medical needs can be served best only by a wide network of medical posts manned by auxiliary personnel supervised by university-trained doctors, whose work would be concentrated in hospitals and public health clinic. Judging by an interview with Soviet Journalists (Meditsinskaya Gazeta Dec. 4, 1974) Dr. Paulenon seems to prefer aid from the Communist bloc to any form of aid from the west . . . 11/

ANGOLA

Angola provides another case study. It is a former Portuguese colony that only recently gained its independence through a protracted armed struggle. The situation in Angola is similar to that in Mozambique with a concentration of health facilities in the urban European areas.

Angola has been divided into fifteen (15) districts. It was the intention of the Portuguese government to construct a central hospital in each of the districts. As of 1966 only two (2) of the fifteen (15) central hospitals had been completed. Also there was one (1) subcentral, thirteen (13) regional and fifty-seven (57) rural hospitals. Other

facilities included two hundred four (204) medical posts, ten (10) pediatric dispensaries, fourteen (14) prenatal dispensaries, six (6) anti-tuberculosis dispensaries and thirty-five (35) maternity wards, seventeen (17) leprosy dispensaries, and twenty-seven (27) village leprosariums. There was a total of 12,813 hospital beds which gives a ratio of one (1) bed per each three hundred ninety (390) people 12/

A look at the leprosy situation in Angola gives one an idea of the task of hand and the shortcomings of the systems. In 1966 about 800,000 people were given examinations for leprosy alone. From this number over 1,500 new cases were diagnosed. Annually, between 1,200 and 1,700 new-cases are found. To care for these people there are seven (7) full leprosariums, twenty-seven (27) village leprosariums, seventeen (17) leprosy dispensaries for outpatient care. The basic mode of treatment is on the outpatient basis with teams employed by the government going about the country side dispensing medicines. 13/

Like Mozambique, the shortage of medical personnel is acute. In 1966 there were only 387 doctors in Angola in either private or government employment. With a population of less than 5 million, the ratio is 1 doctor to every 12,500 habitants. This is a much more favorable ratio than is to be seen in other Sub-Saharan areas including Mozambique with 1 doctor per 60,000 people. 14/ It of course does not approach the U. S. figures of 1 Black doctor per

every 4,100 Blacks. 15/ The table below does show what progress has been made during the period of 1956-1966 to remedy the shortage of health personnel in the country.

	<u>1956</u>	<u>1960</u>	<u>1965</u>
Physicians & Dentists	270	336	387
Nurses & Auxiliary	842	879	932
Midwives & Auxiliary	88	116	n.a.
Pharmacists	28	46	n.a. <u>16/</u>

It must again be noted that these personnel are most abundant in the urban areas of Luanda, Lobito, Nova Lisboa, and Benhuela.

In response to the shortage problem a Medical School was established at Luanda. This school, however, does not award the M.D. degree. Students must still go to Portugal for training.

It has been estimated that with the end of hostilities Europeans fled Angola en masse. The World Health Organization estimated that perhaps 100 M.D.'s remain in Angola at this time. 17/

It is interesting to look at Zimbabwe (Rhodesia) for a point of comparison with the Portuguese colonies. This is true because of the proximity of Zimbabwe to Angola and Mozambique; because of the cooperation all of the white regimes

in Southern Africa have given each other; and most of all because of the impending independence of Zimbabwe. By comparing the health delivery systems we may be able to predict what changes will come about as Zimbabwe faces, in the future, similar problems to those which Angola and Mozambique now face. The difficulty of the transition will depend on the manner in which the final settlement of affairs is accomplished by peaceful means or armed struggle. At present guerilla warfare is occurring in Zimbabwe, though on a small scale. Negotiations are now underway for the peaceful transition of the governing role from the hands of the white minority to those of the black majority. It is hoped that will be completed within two (2) years.

In both the English and Portuguese "colonies" of Africa, situations have been created that have left much to be desired in the way of improving the health care systems in rural and urban African communities. We see again that the main emphasis was in keeping the European population healthy and protected. Any benefit enjoyed by the black indigenous population was due to proximity.

The only mandatory responsibilities of the Rhodesian government bylaws are directed towards preventive medicine. By design the bulk of health care delivery is supposed to fall on the shoulders of the individuals and industry.

However, from its' conception the bulk of responsibility for health care has shifted to the government. This is not to

discount the efforts of industry, especially the mining industry. These efforts by private industry have been sporadic at best at providing hospitals and nursing homes. Traditionally the missions also played a part in health delivery but this was very limited in Rhodesia. 19/

Since 1890 a network of medical services has been established to serve the 5,200,000 Africans at virtually no cost to them. The 1971-72 budget spent R \$18.5 million in health. The total budget was R \$237.7 million. Total cost of health services in Rhodesia was 4% of the GNP at R \$46 million. This is the total spent by industry, government, missions and private persons. Eighty percent (80%) of government money went to service the Africans. While all mission money went for this purpose. 20/

Rhodesia finds itself faced with having to provide medical facilities to two populations which the government interprets as having quite different needs. The reason two populations with many of the same problems should be dealt with differently is a step-child of segregation. The government claims that the "developed" white society needs and demands modern, sophisticated, expensive medical facilities. The other segment of the population needs "massive. . .and simpler facilities." This is an enigma since the government admits the Africans have many more acute and chronic forms of illness due to malnutrition, exposure and work routines. 21/

FUTURE PLANS

I. PREVENTIVE MEDICINE

- (a) Improve water supply systems.
- (b) Improve urban water systems to prevent contamination by waste.
- (c) Private industry must offer protection in working environments and also provide primary care for workers.

II. MEDICAL CARE-----90% of expenditures will be de-

voted to this area of need. Rural clinics staffed by medical auxiliaries are the main African facilities. These will refer patients to regional hospitals and general hospitals. Ultimate referral is to the two (2) central hospitals at Salisbury and Bulawayo. In the future the responsibility for primary medical care will be that of the local communities. The rural clinics will be handed over to the rural townships. Mission hospitals will also have to look toward local aid. The Central Government will concentrate on upgrading selected district and central hospitals. The first beneficiaries of this assistance will be the European hospitals.

The health care delivery systems of Angola, Mozambique and Zimbabwe are similar in many ways. In Zimbabwe one finds the center of the system to be the Central Hospitals in the major cities. The same is true in both Angola and Mozambique. The central hospital in Salisbury, for example, is the main referral depot for the entire country. It is also the

teaching hospital and main research center for the University Medical School. There is a similar hospital for the University Medical School. There is a similar hospital, though not of the magnitude, in Bulawayo. These two hospitals mentioned above represent the ultimate in medical care in a nation of 5.5 million people.

In Mozambique the situation is similar. A population of 7.3 million is served by three (3) central hospitals in Laurengo, Morgues, Beira and Nampula. These are the three (3) cities that contain about ninety percent (90%) of the European population, but they are meant to serve an area of 800,000 square miles.

CUBA

A third case study is that of Cuba, a nation that has undergone changes in its political and medical delivery systems.

Cuba, under Castro, has drastically remodeled its health care delivery system to the point that practically every location in the country is well covered with auxiliary personnel.

The remarkable health care program now in operation has as its first objective fulfillment of the desires of the people, by access to a doctor and a hospital bed. A close second has been eradication of communicable disease. . . 22/ Signs of change in the system are reflected in the following:

Annual cases of malaria have fallen from 3,600 cases to 950; tetanus morbidity is one-third (1/3) the 1962 figure; TB and acute diarrhea is one-fourth (1/4) as many as in 1962; ninety-nine percent (99%) of new borns are delivered in hospitals versus one-half (1/2) in 1959; and the public health budget is now over \$300 million as opposed to \$23 million in 1959. There were 8,000 doctors in Cuba in 1959. Three thousand (3,000) of these left after the rise of Castro. Training programs have brought the number back to eight thousand (8,000) physicians.

The national government has now organized health delivery under the Ministry of Public Health. The nation is divided into seven (7) provinces and are further sub-divided into regions. Each region has a general or central hospital with as many as ten (10) other hospitals. There are also 320 so-called polyclinics spread throughout the country.

Cuba is solving its problem of physician shortages by graduating 800 doctors per year from the four (4) medical schools. These people complete a six (6) year course of study followed by one (1) year of internship. Each student must serve two (2) years in the rural areas before beginning specialty training. Some are sent abroad for specialty training to Russia, Eastern Europe countries and Mexico. 23/

The government also runs a public health school. The four (4) main functions are:

- (1) To teach a one (1) year MPH course and a two (2) year health specialist course for doctors and dentists.
- (2) To give training courses in laboratory technology, pharmaceuticals, physiotherapy and dental hygiene. These are courses that last two (2) years after the completion of high school.
- (3) To run the nursing schools. These are attached to the large hospitals around the country.
- (4) To organize the labor force of medical students which works in the polyclinics, and hospitals.

Cuba is also improving the ratio of hospital beds to patients in the rural areas. In 1959, 55% of Cuba's beds were in Havana, now the number is down to 45%. The emphasis is on decentralization.

Dr. Boyd states that there is no area in Cuba without some health coverage. Boyd cites the example of the mountainous region around the small town of San Blas, a region of coffee growers that is very remote from Havana. Even here, there is a system of care which includes a newly graduated doctor running a twenty (20) bed hospital which is the referral point for three (3) nursing stations and six (6) Red Cross outposts in the bush. This, according to Boyd, is the closest he saw to a solo general practice in Cuba. He states. . .

"There is no question that Cubans, all Cubans, are enjoying the best health care in Latin America." 24/

Dr. Boyd does point out some shortcomings in the system. He says there are too many administrators of health, even in the polyclinics. The posts are manned by M.D.'s, a waste of valuable manpower. More emphasis should be placed on sanitation measures now rather than just training doctors and building hospital beds. Boyd thinks that the polyclinics should be upgraded and the hospital down-graded.

Outdated traditions should not be upheld at the expense of efficient medical care. Another of Boyd's observation is the failure of the family practitioner to treat the entire family because of a tradition of the children and mother having their specialist. Therefore, it takes at least three (3) different doctors to care for a family.

Boyd thinks that Cuba will soon have too many doctors and they will be reduced to doing the work normally assigned to paramedical personnel.

As a closing statement and in summation Dr. Boyd states:

The hard work and dedication of the senior civil servants and many of the junior ones, without the types of incentive found in Western countries, have borne rich fruit in the last fifteen (15) years. With slight changes in direction, Cuba could become one of the models for health care in the world. 25/

We have now examined a spectrum of health care systems. We have what can be. Cuba obviously had more to work with seventeen (17) years ago when Castro took over than Zimbabwe, Angola or Mozambique now have. The important thing is that Cuba has demonstrated that with proper priorities and hard work the health care delivery system can be changed rapidly

and drastically. Cuba has made up a deficiency of 3,000 doctors in only fifteen (15) years. The government has also turned out numerous auxiliary personnel. The same can be true for the African countries once they have freed themselves of the colonialist. Hopefully, countries like Cuba and China will serve as their examples.

URGENT CRISES POSED BY TRANSITION

The definition of the health problems of Zimbabwe and the identification of health resources applied to these problems demand the use of available, reported data and the application of certain assumptions. From the information that has been developed, conclusions have been drawn regarding the basic health problems for the country. These basic problems relate to three causative factors, and are further influenced by three modifying factors. The three causative factors are the following:

- The maldistribution and poor utilization of basic health services.
- The problems of food use and consumption.
- The inadequacy of basic environmental sanitation.

The modifying factors are:

- population change,
- health education, and
- transition to majority rule.

The allocation of basic health services in Zimbabwe are skewed in such a way as to make health care more available for the urban population, but less available for the rural population. To some extent, the rural population may utilize inappropriately the sources offered, a problem that may be exaggerated during transition. Nevertheless, the maldistribution of health services and the inadequate volume of these services are manifested by the large number of deaths and high morbidity caused by preventable diseases, the inadequate coverage of the population by immunization, the absence of semi-professional attendance at the time of delivery (especially in rural areas) and the high infant mortality. Since Zimbabwe has, decided, in general to solve the problems of communicable disease control by the provision of basic services through a network of local health centers, rather than by conducting mass campaigns, during the transition it will be necessary to provide sufficient resources and services, and appropriate distribution to meet the basic needs. For many of the rural areas this should be a major concern.

Containment of various endemic diseases such as plague and cholera should be a chief concern of the government during the transitional period. Appropriate surveillance of tuberculosis and leprosy should be continued.

In order to manage many of these disease-related problems during this critical period, and for some time in the

future, health personnel from other countries will be needed. This will insure the continued operation of public facilities such as water, sewage treatment, and the maintenance of electrical power in urban areas.

It is reasonable to expect the rate of migration of rural Africans to the cities to increase during this period. Should this occur, it will present the government with the problem of overcrowded housing. The health consequences of this phenomenon are well known. In this particular instance control of the Aedes mosquito should be a major concern. Aedes transmits yellow fever, dengue, encephalitis, and filariasis. An occurrence of these diseases would pose serious economic and social problems for Zimbabwe in terms of health and quarantine imposition and would severely affect trade and economic development.

The problem of food use and consumption are manifested in the form of malnutrition in a majority of pre-school children and also a significant segment of the general population. Malnutrition is seen in protein-calorie deficits resulting in retarded growth and development, in high prevalence of endemic goiter due to iodine deficiency, and in a high prevalence of vitamin A deficiency. The results of malnutrition intensifies the inadequacies of the health care system by increasing the burden of disease which requires treatment and by producing diseases of greater severity. Specifically, the high mortality rate from childhood diseases correlates

closely with malnutrition. In addition, the relationship of malnutrition to enteric infections is a vicious cycle. The enteric infections themselves cause and intensify the malnourished state by means of malabsorption, altered food consumption, fluid losses and increased metabolism. It has also been demonstrated that in malnourished populations, children especially, suffer a far higher incidence of enteric infections, presumably because of lowered resistance. The additive effect of parasitic infestations further burdens the already debilitated state of the population. The end result of this is manifested in excessive complications of childhood disease and death, poor growth and development and ultimately decreased intellectual and physical productivity of the population.

The problem related to environmental sanitation have been alluded to earlier - - enteric infections carried by contaminated water and food, and intestinal parasitism, partly as a result of inadequate sewage disposal, agricultural and industrial water contamination control.

The high morbidity and mortality resulting from these infections have been cited. In addition, these infections are more serious because of the poor nutritional status of the population and the inadequate volume and distribution of health care services. All of these problems create situations that should concern the transitional government.

The three major problems - - - distribution and utilization of health care services, food use and consumption, and environ-

mental sanitation - - form an interdigitated network of problems. Consequently, the management of the problem during the transitional phase of Zimbabwe, will depend on a stable transitional government. The capacity to meet the basic health needs of the population will depend upon management and coordination of these interacting agencies by working simultaneously with these basic problems, rather than in a disjointed way.

Three modifying factors have been identified: population change, health education and transition to majority rule. The population change is manifested by rapid growth among the African elements. Conservative projections estimate that the population will double with the next twenty (20) years. In addition, there has been a rapid flow of the rural African population into major urban areas. It is in these urban areas that a large percentage of Rhodesian revenue is produced and distributed among that population. As a result of this distribution of revenue and the services generated, there has been a steady shift of the African population to urban areas. The result has been growth of the urban areas with high unemployment among the African population, and demand for services. The two trends of population growth and population shift are not seen as problems per se but rather for the burden of maldistribution that is placed upon the society. This situation will probably continue during the transition period. It has been shown in similar situations that the distribution of services does not keep pace with

current demands and is certainly not equal to the task of the projected population changes. In order to deal effectively with this problem during the transition a systematic increase of basic health service should be instituted immediately. The same situation should prevail for food production and environmental services.

The other modifying factor is health education. The level of elementary knowledge of basic hygiene, nutrition and child growth and development significantly influences the demand for, and consumption of, health care services in most societies. In many ways, the health status of an individual is dependent upon the results of many individual decisions and actions. Insofar as these decisions can be influenced favorably by basic health information and positive experience with health care situations, this type of action should be a major policy concern of the transitional concern of the transitional government. Such a policy should result in better utilization of available services, limiting the spread of infectious diseases, such as cholera.

The nature and political structure of the transitional will obviously influence - - - the type and distribution of health care services. It should be emphasized that many other sectors of the Rhodesian economy will have a bearing upon the ultimate status of the health of the population. For instance, policies of the agricultural sector should reflect the basic human needs for adequate nutrition. When agricultural policies

do not reflect or exceed these needs, waste of resources occur and human suffering can result. If it is the aim of any foreign government to contribute to the total growth of the Zimbabwean economy during this transition period, the implications of the health problem at present and those arising during this transitional phase require serious consideration.

HEALTH INFORMATION NEEDS

The intent of this section is to identify and describe the elements needed to satisfy the data requirements of the Zimbabwean Ministry of Health during and after the transition to majority rule. Data analysis is a prerequisite for rational health planning during this period. For the Ministry of Health to fulfill these functions, data needs to exist in the following areas.

Population - At - Risk - The identification and description of the population served by the Ministry of Health in both urban and rural areas.

Health Status - Health status data is particularly related to population data. This type of information will allow the Ministry of Health to monitor and evaluate over a time period, improvements in the health of the Rhodesian population.

Health Facilities and Services - It is important to analyze the efficient utilization of services and facilities. Analysis of this information will assist the

Ministry in identifying duplication and preventing the occurrence of unnecessary duplication of health resources.

- Ambulatory Care - Analysis of the ambulatory care data in conjunction with hospital facilities and service data will allow for the development of a rational decision making mechanism for the Ministry of Health.
- Health Clinics - These data can increase the Ministry's knowledge about the accessibility and continuity of health services in rural areas, especially when analyzed in relation to population and health status data.

In order to extend the available data and fill the gaps in information, a health survey is indicated. Since existing record systems do not generally afford complete coverage of needed information, survey data may supply important information on topics such as health status and utilization of resources. Surveys may also provide data on such attitudinal questions as acceptance of services and other barriers. They may also provide a means for obtaining data for use in estimating the number of persons in rural areas awaiting hospital admission or those who fail to seek care.

During the transition period a set of baseline statistics about the health manpower of Rhodesia is needed. There is also the need to develop a small staff of trained personnel

in rural and urban areas capable of collecting, processing and analyzing health manpower statistics. Data derived from these systems are intended to provide basic information on the numbers, characteristics, and distribution of health manpower on a continuous and periodic basis for use by the Ministry of Health. This will provide a sample frame-work for a variety of surveys. A minimum data set should be established for the various health manpower occupations. These occupations include physicians, nurses, dentists, various allied health workers and administrators. The Ministry might consider collecting the following items of information on these occupations:

- Name
- Mailing Address
- Identifying number
- Type of Occupation
- Type of Licensure
- Year of Graduation
- Birth date
- Sex
- Race or Color
- Years active in Occupation
- Activity status in Occupation
- Country of origin
- Place of Work
- Mobility - Migration
- Primary Activities

Analysis of this data can fulfill the following purposes: to assess the current health manpower capabilities relative to the needs for health services; to project future demands which will be made on the supply of health manpower, especially during and after transitions to majority rule.

CATALOGUE OF HEALTH CONSEQUENCES

In assessing the possible health consequences of transition, the following criteria were imposed:

1. Existing or potential unmet needs that can be met by organizing or reorganizing resources.
2. Factors determining relative levels of utilization of specific services.
3. Factors accounting for discrepancy between need for a service and its utilization.
4. Are existing services being used to their fullest, or does there appear to be an over-supply of certain services?

The final assessment reveals a too heavily bureaucratized health service with its consequences: an unwieldy organizational structure, decision making too centrally concentrated, and no provision for effective community input.

We can anticipate the inevitable manpower shortage with attendant maldistribution, appropriate food shortages and distribution, increased trauma due to civil strife and belligerency, and concomitant refugee problems, i.e., rural to

urban migration. Transportation dysfunction with problems affecting distribution of food and medical supplies, breakdown in existing sanitary engineering services as well as it's sequelae of water-borne infectious disease epidemics.

CATALOGUE OF HEALTH RESOURCES CONSEQUENCES

Identification of Specific Problems

Provisions must be made for the following:

1. Immediate organization of Health Ministry to function on a "needs" basis.
2. Mass immunization for preventable disease, e.g., typhoid fever, measles, etc.
3. Mobilization of food and its distribution using acceptable food and food supplements.
4. Temporary hygienic living conditions with appropriate water supply and waste disposal.
5. Refugees, provisions for.
6. Rodent and vector control.
7. On-the-job training for operation of critical health facilities and sanitation installations.
8. Maintenance of integrity of existing health facilities.
9. Mobilization and augmentation of health manpower.
10. Containment of current plague outbreaks in Matebeleland and cholera on the eastern border of Rhodesia.
11. Promotion of primary care.
12. Neo-natal tetanus

PROFILE OF HEALTH MANPOWER AS OF DECEMBER 31, 1975

PHYSICIANS

A total of 890* medical practitioners appear on the registry maintained by the Medical Council of Rhodesia. 1/ This is compared to 853 medical practitioners which were registered in 1973, and 860 in 1972. It should be noted that the appearance of these names on the registry does not mean that they actually live and/or practice in Rhodesia. However, assuming that these figures are correct, the physician to population ratio was 1:6620 in 1972 2/ as opposed to 1:7090 in 1975. The physician to population for Rhodesia appears quite favorable at this time in comparison to other African countries such as Nigeria (1:25, 550), Burundi (1:45, 950) or Kenya (1:16, 290). However, in comparison to South Africa (1:1960), Egypt (1:520) and Spanish Sahara (1:1820), Rhodesia does not compare favorably. 3/

These figures are grossly misleading, since in Zimbabwe it is stated there is a 1:8300 physician: population ratio. 4/ This figure compares with the official Ministry of Health report as of December, 1975 of 1:7090. These figures must be scrutinized for an assessment of distribution of physicians.

Eighty-nine percent (89%) of the doctors were found to be located in the twelve (12) largest towns. The other eleven percent (11%) were scattered throughout the country in rural areas. This emphasized the point that there is one doctor

for every 1650 urban dwellers but only one doctor for every 45,500 rural inhabitants. We must keep in mind that only eighteen percent (18%) of the population is urban therefore eighty-nine percent (89%) of the physicians provide care for eighteen percent (18%) of the population.

Gelfand has spoken to this issue many time in the literature:

We continually hear from doctors, health administrators and other that the right kind of doctor is not being produced by our medical schools. Their feeling is that our graduate prefer entering one or the other form of specialist practice and not only do many of them settle in rural areas, where they are needed most, but do not even remain in Rhodesia after registration. 5/

The ethnic proportion of physicians in Rhodesia was not available in the literature surveyed. However, Gelfand indicated that as of November 1975, thirty-nine (39) Africans had graduated from medical school in Rhodesia. None of these graduates have opened practices in Rhodesia. Ten (10) are studying for higher diplomas in pediatrics, surgery and pathology; one (1) has become a specialist in preventive medicine. About five (5) African doctors are in permanent employment in the Government Medical Service. 6/

The number of registered physicians by specialty was not available in the literature surveyed. The number of students entering medical school at the University of Rhodesia is expected to reach eighty (80) students per year when the new medical school teaching hospital complex at the Andrew Fleming Hospital is completed. 7/ There will be great emphasis on

the production of general practitioners who will locate in rural areas.

Approximately forty (40) physicians are on the staff of grant-aided medical missions; 8/ twenty-two (22) work either full time or part-time for local authority health departments; four (4) physicians work for non-grant-aided medical missions; forty-eight (48) physicians work for industrial medical facilities. 9/ The number of physicians which are employed by government hospitals (teaching, research, patient care) and the number in private practice is not available.

The position regarding the shortage of doctors in the Ministry of Health has continued to deteriorate during 1975. As of December 31, 1975, there were ten (10) government medical officer vacancies, three (3) district medical officer vacancies, three (3) vacant anesthetist positions, two (2) TB officer positions vacant and eleven (11) vacancies for hospital medical officers. 11/

NURSES

The categories of nurses which are registered in Rhodesia are as follows: State registered nurses, maternity nurses, and state registered midwives. As of December, 1975 there were 4,688 registered nurses (of that total 172 are classified as mental nurses, 59 as fever nurses and 29 as sick children's nurses). 12/ There were 4,267 nurses in 1972. 13/

State registered maternity nurses and midwives totalled 2,041 in 1975 and 1,043 in 1973 and 1,793 in 1972*. 14/ In 1975 there were 65 midwives who passed their qualifying examinations and 204 general nurses of which 98 were African.

Medical assistants, maternity assistants and nursing assistants totalled 4,952 in 1975 and 1,851 in 1973. These types of auxiliaries have been African "boys and girls" and have been employed in rural medical facilities, African hospitals and mission hospitals.

The ethnic profiles of registered nurses and midwives are not available.

One hundred ninety two nurses (192) nurses are employed by grant-aided medical missions, eleven (11) by non-grant-aided medical missions, one hundred thirty six (136) by local authorities and sixty-three (63) by town, rural and African councils. It might be assumed that all other nurses work in government hospitals, with private physicians, in private hospitals or are not working.

There was also new emphasis placed on the Medical assistant and on the advanced clinical nurse. The medical assistant would be heavily trained in data collection, diagnosis and treatment of simple diseases. The immediate objective would be to get this person into the small villages and rural areas where they would be readily available. Advanced clinical nurses will complete a two (2) year course at Mpilo Central Hospital in Bulawayo. The nurse will be heavily trained in

the clinical specialities of OB-Gyn, Medicine, Surgery, Anesthetics and Pediatrics. It is hoped that the ACN would be used either to help staff regional hospitals as a physician assistant or man one of the rural hospitals with a physician making visits periodically.

DENTAL MANPOWER

In 1973, there were one hundred fifty one (151) dental surgeons registered in Rhodesia as compared to one hundred forty four (144) in 1975 and 1972. The dentist to population ratio for 1975 was 1:43,800.

The number of dentists employed by the government is not available, however, it would appear that of those practicing with the government most are older practitioners. In 1975, only one of seven dental surgeon posts were filled continuously during this year. It might be assumed that like physicians, the vast majority of practicing dentists are concentrated in the large urban centers and serving a fraction of the population. 15/

Dentists who work for the government provide services for some school children, the British South African Police, prison officers, military personnel, patients in African hospitals (fractured jaws, extractions) and student nurses working in the major government hospitals.

During the transition to majority rule it might be reasonable to expect a significant number of the medical

staffs associated with the major teaching institutions, the private hospitals, and the government hospitals in the urban areas will more than likely leave the country. From the data reviewed it appears that these individuals are white Rhodesians with interest in administration, teaching and research. The result would be a major professional and administrative manpower shortage in these facilities. Health manpower (nurses, midwives, nursing and auxiliaries) associated with rural hospitals and clinics, African councils and mission health facilities is basically African and, in theory at least, could remain intact during transition. In fact, these workers will be extremely important in maintaining a health delivery system in rural areas during and after transition to majority rule.

It would also be reasonable to assume that the health manpower associated with industrial companies will remain active during the transitional period except in the event of a cataclysm.

The African Health Assistant, although he is not a health professional per se would be extremely important in maintaining and supervising public health matters in the rural and African areas. This particular worker is capable of performing the following functions: health education, instruct in simple rural sanitary methods, advise and supervise local efforts in vector control, and report unusual circumstances of significance to the health of rural people.

FACILITIES

Health services are provided in a variety of health facilities in Rhodesia. These facilities include: (1) government hospitals in Salisbury and Bulawayo, small district/general hospitals in other urban areas, and rural hospitals and clinics; (2) mission hospitals; (3) local authority medical care facilities; (4) industrial medical facilities and (5) private enterprise hospitals.

As near as can be determined, there are from nineteen(19) to twenty-one (21) governmental hospitals with a total bed capacity of 1500-2500. The manner in which these beds are distributed between Central, general, district and rural hospitals, as well as the distribution of the types of beds (acute care, chronic care, maternity, TB, etc.) is not explicit from the literature.

There are eight (8) industrial (mining) medical hospitals with a total of sixty (60) for whites and nine hundred eighty three (983) beds for Africans. In addition, there are sixty four (64) African beds in a total of thirteen (13) clinics operated by the mining companies. There are eight (8) hospitals and clinics with two hundred eighty six (286) beds which are operated by other industries. 16/

The number of hospitals and clinics which are operated by local authorities and councils (towns, rural & African) is not available.

The ability of these health facilities to function during

transition will depend upon the availability of health staff personnel. It would appear reasonable to assume that the central and large general hospitals will be the first to close due to manpower shortage. Mission, industrial and rural hospitals and clinics maybe expected to function reasonable well in the absence of a violent transition period.

The system can be summed up in Webster's description, presented in a paper to the Rhodesian Medical Congress in 1968, that while 50% of the total expenditure in 1968 was for hospitals, other medical services account for 40%, of the remaining 10% from which training and research are drawn for preventive medicine services". . .because the hospital and other sectors of medical care services, of course must not be denied anything." 17/

CAPACITY TO MANAGE HEALTH PROBLEMS DURING TRANSITION

The lack of accurate information and baseline data leaves this question answered but undocumented. We can only assume that the present inadequacies will not be alleviated within a short period of time without outside aid.

From available data, there does not appear to be enough technical personnel with the capabilities to immediately assume leadership in the health areas.

From the literature and personal communications, there appear to be only one physician with the minimal training in

public health required to assume, leadership in that area. Assistance from other nations, in an advisory capacity would be a logical alternative at this time.

PROBLEM-SOLVING CAPABILITIES

These will depend on how wide the gap exists between assessed needs and existing resources, the degree of ethnic strife and mobilization of educational and training programs in the region, in Zimbabwe or elsewhere.

The identification of deficiencies, i.e., the determination as to what extent the system can or will be able to fulfill the objectives agreed upon, and in the event of incapability, what machinations will be necessary, is critical. To effectuate these changes requires detailed specifications as to what the adequate system should be, i.e., technological, policy, procedural staffing and facility alterations. Finally, alternative strategies must be examined and presented and project planning in terms of specific tactics, resources, conditions which may have to change in the community, activities to be accomplished and their relations to each other and above all cost in time and resources.

We have been able to discern that presently it is not possible to define a quantified optimum desired to reduce or contain each problem, determine the status of the current programs to compare to the anticipated outcome, or to measure the deficiencies in the current system relative to the optimum.

There is a definite need for redistribution of the health resources facilities in Zimbabwe. The existing health provinces are shown in Figure 2. The inverse ration of physicians to population presented in urban Rhodesia leads one to assume that the locations of some of the present facilities were for European convenience.

The number and location of regional health facilities is a decision which should be mandated on a consensus basis, by the "partnership in health," the consumer and the provider in a formal manner, e.g., the feedback-input system alluded to previously.

It would be naive to discount the category labelled "vested interests," since it exists in any political system.

If community involvement is a reality there should be an efficient mechanism to make input to the appropriate policy-making body, be it local, regional or national.

If the problems are to be solved, there must be responsiveness, sensitivity, patience and accessibility on the part of the staff. There should be a formalization of the relationship for, "participation without power is a cynical ritual." Inherent in the concept community participation is community responsibility.

The second area of concern is health manpower. The relatively small number of health professionals makes it even more important that there be a more rational distribution system. Admittedly, one would not expect to be deluged with volunteers for service in the rural areas but a mechanism

could be initiated to ensure adequate availability or accessibility to upper echelon professionals, e.g., physicians and registered nurses.

The second level of manpower could be increased with less difficulty than the former, if they should be indigenous to the area in which they would serve, e.g., school teachers, extended family members. An analysis was presented the overview and is admittedly lacking in data. This was due to the paucity of current information.

An elevation of nurses to the "near-doctor" level and subsequent levels of health workers moved "up a notch". This plan is complementary to the health problems of Zimbabwe. Watson states that:

The measures that most improve the health of the people are those that deal with the commonest causes of sickness and death...The major problem is community ignorance of the true causes of disease, and of what needs to be done in the way of prevention and treatment. To improve community health we need staff who can; teach people about health, the prevention and treatment of the common diseases and family planning, provide the means for simple prevention of the common cause of sickness and death...provide effective treatment for the common cause of sickness and death... provide effective treatment for the common causes of sickness and death...most commonly health needs can be met by auxiliary health workers. 18/

He further contends that we concur with:

When illness is so serious, the prognosis is often poor no matter who treats the patient. When these conditions do become clinical problems, transfer to specialist care is desirable if it is possible. The central proposition in promoting the concept of the auxiliary health position that health like other services must be looked at from a cost benefit point of view and not just from an emotional one. To put it bluntly, we must ultimately accept that

a few people will be incorrectly diagnosed and/or managed and even die in order that the majority may receive a reasonable standard of health care. The alternative is a high quality service that reaches fewer people. When this situation exists, many people die from easily prevented, easily treated diseases because no one at all is available for them. 19/

Malnutrition is the Scylla and its deteriorative effects on the body are certainly the Charybdis of Zimbabwe. As has been stated in a previous section, the solution is in providing an available, economical and most important, an acceptable means of alleviating, or at least, ameliorating this problem.

Immediate institutions of a massive preventive medicine and health education program must be prioritized highly in order to effectuate programs curative drugs for the appropriate preventable and treatable diseases, vector control and housing. The latter will undoubtedly be an item of particular importance because of anticipated migration to urban areas from rural districts by Africans. This migration is predictable on an historical basis as well as a logical one. Whether the transition is peaceful or cataclysmic, this phenomenon will occur since people tend to believe that urban areas hold the solution to their problems particularly during times of social and political disruption.

Attendant to this migration, the areas of transportation and health facilities will be extended to their limits.

The vague question of the likelihood of civil war or ethnic strife portends a multiplication of the above problems not only because of the increased numbers of people who will

be dislocated or injured but because of the militaristic impositions. "More common indicators of emnity included confiscation of transport vehicles, long delays of food convoys at military checkpoints, declaring needy zones off-limits, and commandeering civilian-destined supplies for military use." 20/

It is extremely prudent that provision be made in the area of health services and the watchword is to "prepare for the worst." Morris Davis speaks to this issue very cogently in Civil Wars and the Politics of International Strife:

Just as earthquakes mainly devastate earthquake prone areas...civil wars chiefly occur in what might be termed civil-war prone areas. It is not merely that one looks back from a given civil war and finds historical roots and causes. That game one can always play. Rather, before the war on the basis of recent indicators like communal uprisings, political coups, and widening ethnic cleavages one could have predicted with fairly high probability that civil conflict would arise again and in heightened form sometime in the near future.

The relatively predictability of civil wars... can facilitate logistical preplanning. It is futile however, to expect such preplanning to have been carried and in other than a formative paper-project sense by the countries experiencing the strife. 'Foreign assistance in a national disaster, according to Russell S. McClure, foreign disaster relief coordinator for AID,' is able, after all, only to supplement a nations own relief efforts - - it can never replace them. 21/

In this light, it would be prudent to accept the likelihood of some form of belligerency during the transition period.

In conjunction with agriculture and economic sectors,

the development of a program for self-sufficiency in meeting nutritional requirements for the population is a very reasonable possibility. The country has the means, e.g., manpower and available land, to accomplish this end but success will be determined largely by the methods employed. To continue as a provider of exportable foodstuffs, Zimbabwe will have to draw on the expertise of other nations in the event of wholesale "white flight". Her first priority should be the provision of "enough food of adequate nutritional value for her own people."

After a more in-depth assessment of the health manpower status in Zimbabwe and reorganization of the health ministry, manpower requirements may be more accurately estimated. This is an era fraught with information gaps and which requires immediate attention.

PROGRAMMATIC IMPLICATIONS

The major conclusions arrived at by what must be termed a cursory study, in terms of the problems which are legion, can be summed up as the following:

1. Reorganization of structure of the delivery system which should allow for local prioritization and planning with community feedback.
2. Augmentation of preventive medical and health education programs, particularly basic sanitation and vector control.
3. De-emphasize curative medical programs.
4. Production of foodstuffs to meet the requirements of the populations.

The short range priority targets for immediate program considerations must include:

1. Alleviating manpower needs by more efficient distribution and training. Emphasis need not necessarily be placed on the physician-population gap.
2. Safe water supply.
3. Sanitary waste disposal.
4. Interim functional organizational restructure.
5. Development of training of family health workers-general purpose in nature to serve the extended family which is basic community unit.

6. A palatable, economical and acceptable food supply to meet the protein-calorie requirements needed to sustain a malnourished population.
7. Continuation of existing vector control programs.
8. Interim health policy.

For the long range outlook:

1. A permanent structure for the Ministry of Health
2. A national Health Policy within the context of overall multidisciplinary national development policy.
3. The establishment of a training institution and/or reorganization of existing institutions.
4. An interlocking relationship with other ministries in decision-making.

RECOMMENDATION ON ORGANIZATION

We are now considering these recommendations for the future.

A basic reorganization of the structure is necessary. The objective is to concentrate resources at the most peripheral unit where maximum benefit can be achieved in all areas of health. We term this as the concept of accelerating peripheral augmentation (APA). In effect, this translates to extending resources peripherally or rurally so that the greatest impact is farthest away from centers of urban population. The central administration would consist of a minister administration, a national health advisory council composed of senior officials of other ministries. This overlapping of bureaucracy allows for planning related to health as well as other areas since an official of another ministry would be available for information and resource input to effectuate rational and logical planning. "Directly or indirectly, all community decisions influence health status..." 22/

Central administration should consist of management functions and its structure should facilitate the concept that it is the "conduit" through which a national policy flows to the periphery.

Operations planning and programming should be a function of the regional office. Inherent in the model should be a

strong community participation framework in the determination of priorities, needs and as a facilitative mechanism for implementation of problem-solving schemes such as health education, community sanitation projects, preventive medicine, and environmental health. All of these areas depend heavily on the support of strong community involvement.

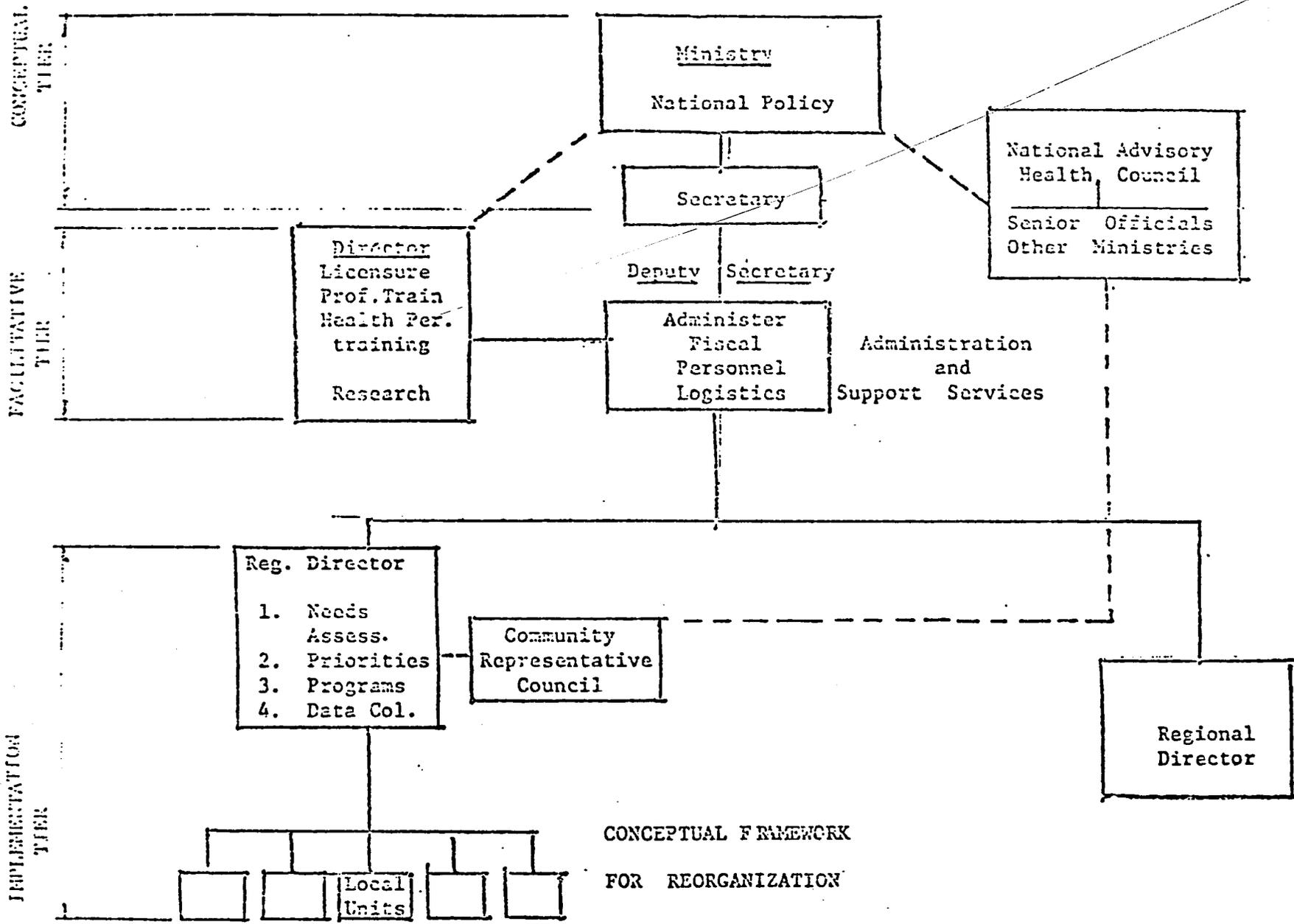
Community involvement is a means of not just supplying the problems but contributing to solutions by way of input, feedback, and winning the confidence of the people. To this end a community advisory board should be an integral part of the regional office.

The regional office should be debureaucratized to the extent that its functions should be concentrated, i.e., programs should be merged to the point of offering as comprehensive a service as is practicable.

Example: Maternal and infant care programs should be implemented in conjunction with other personal health care programs, i.e., family health. Preventive medicine should include on an operational basis health education, environmental health, etc.

In other words, service should be provided in the most practical manner of "de-clinicize" programs. An M&IC clinic is largely for the convenience of professionals therefore, it is unreasonable to have a family travel miles for tuberculosis clinic and find that a well baby clinic does not meet until a few days hence.

These services will necessarily be provided by an auxiliary health worker the further to the periphery one



CONCEPTUAL FRAMEWORK
FOR REORGANIZATION

one extends these services. This extended family health worker may be the ultimate provider of health services in many areas.

In effect, this concept of Peripheral Augmentation should decrease bureaucracy and determine needs and priorities on a local or area basis while being in consensus with national health and socioeconomic policy as pronounced by the Central body and providing information and feedback to the Ministry. This concept should help in fulfillment of the concerns of Adenyi-Jones by reaching the population-at-risk; decreasing cost and satisfaction of the public.

Functionally, the emphasis should be on primary health care and its elements, namely: acute and chronic illness care, basic sanitation, disease control, and health education.

This model for health services should make positives in place of the negativism that exists. It should be incorporated into the total human service system with overlapping goals for the solution of similarly overlapping problems, not tangentially but directly interjecting information into appropriate service bodies not related to the precise area but whose policy would have a bearing on the outcome. This regionalization would promote more efficient logistics and the decentralized region would be able to prioritize in terms of specific problems determined on the basis of local option.

Need should be the basis of structure and structure should be the basis of function. This premise has obviously

ignored in respect to the concept of doing the most good for the most people in the past in minority-ruled Rhodesia.

IDENTIFICATION OF FURTHER STUDIES RECOMMENDED

The information gaps in certain areas of this study produce some unreliable conclusions. Some published material was found to be contradictory and therefore fallible.

Data which obviously should be available, e.g., the number of African physicians in the country is conspicuous by its absence.

Though over 2,500 titles were obtained from the National Library of Medicine's Medlars system, many of these were not appropriate in regard to the specific information required.

The information hiata were for the most part in critical areas such as manpower, environmental health facilities, etc. Biostatistical data pertaining to the African population is universally unreliable due to a lack of a practical reporting system.

Specific studies should be made in the following areas:

1. A comprehensive public health engineering survey to determine feasibility of appropriate alternatives in water and waste disposal method and disease control.
2. An extensive manpower survey.
3. Methods to determine utilization of traditional healers in the proposed system.

4. Survey of Missions to determine more accurately their future role, hopefully more in concert with a national health policy.
5. Determine priorities based on the needs of the population itself.
6. Determine costs.
7. An in-depth ethnological study to more accurately serve the people by adhering to the several value systems insofar as is practical.