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HEALTH AND DEVELOPMENT IN SOUTHERN AFRICA

Volume II

A Review of Health Care in Zambia:  
Issues, Analyses, and Recommendations

This sector assessment was undertaken in conjunction with the Southern Africa Development Analysis Project and has been used extensively, but not totally, in the Main Report and Country Papers

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SOUTHERN AFRICA DEVELOPMENT ANALYSIS PROGRAM  
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## I. INTRODUCTION

### A. Background and Acknowledgements

This review of the health sector in Zambia was conducted as part of a comprehensive assessment of the health sectors of all Southern Africa countries being undertaken for AID's Southern Africa Development Analysis Program (SADAP). Performing the review and analysis that are contained in this report was a collaborating team comprised of a special consultant as Team Leader and professionals from the staffs of Family Health Care, Inc. (FHC) and Africare.

The field visit phase of the project was conducted from July 2 to July 16, 1978, by the four-member FHC/Africare team. The team was composed of the following professionals (days spent in-country are in parentheses):

William J. Bicknell, M.D., M.P.H., Professional Associate, FHC (Team Leader) (14)

Ronald A. Schwarz, Ph.D., Lecturer, Department of Behavioral Sciences, School of Hygiene and Public Health, Johns Hopkins University (15)

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Alameda Harper, M.P.H., Public Health Specialist, Africare (15)

During the total 57 person-days in-country, the team visited individuals and health facilities in the following provinces: Central, Southern, Copperbelt, and Northern. Major cities visited included Chitankata, Lusaka, Kitwe, Mwash, Ndola, and Kasama. The team was able to collect a comprehensive variety of information and materials, and conducted dozens of interviews with providers,

planners, and administrators in health programs in both the public and private sectors. There were collaborative discussions with officials of the Ministry of Health concerning the health needs, health resources, and constraints in the health and family welfare sector, and concerning the priorities of the country's health plan. Discussions were also held with the Ministries of Economic and Technical Cooperation, Finance and Labour and Social Services and a number of other governmental and private organizations.

Attached as an Appendix is a list of persons and places/institutions contacted and visited by one or more team members. Those places and institutions actually visited are underlined. All institutions, unless otherwise noted, are located in the Zambian Capital, Lusaka.

Activities of the team with the Zambian Government were coordinated through Dr. Siwale, Assistant Director of Medical Services for Planning and Development. The team wishes to acknowledge the excellent support and cooperation of Dr. Siwale and the other individuals who allowed us, on short notice, to meet and discuss health issues with them.

Dr. Ronald A. Schwarz is the principal author of this report, although all team members as well as FHC/Africare staff reviewed the preliminary draft and made both substantive and editorial changes. In addition, Robert N. Grosse, Ph.D. of the University of Michigan's School of Public Health, served as a technical reviewer.

B. Summary Statistical Profile of Zambia

<u>GENERAL</u>	<u>1969</u>	<u>1976-77 or Most Recent Estimate</u>
Per capita GNP (US\$) at current prices	\$320 <sup>o</sup>	\$460 <sup>g</sup>
Population (midyear, in millions)	4,057 <sup>c</sup>	5,138 <sup>m</sup>
Land area (thousands of square km)	752.6 <sup>c</sup>	752.6 <sup>c</sup>
Population density (per sq km)	5.4 <sup>c</sup>	7.0 <sup>a</sup>
Urban population (% of total)	-	37 <sup>m</sup>
Labor force in agriculture (%)		69
Age structure (age group population as % of total)		
0-4	-	45.8 <sup>a</sup>
5-14	-	40.3
15-59	-	9.3
60+	-	4.6
Adult literacy rate (%) (estimated)	10-15%	20-30%
Electrical energy generated (millions Kwh/year)	3,653 <sup>g</sup>	5,151 <sup>g,p</sup>
Kilometers of Roads <sup>n,g</sup>		
Paved		4,000
Gravel all weather		7,400
Earth (classified, maintained by Road Department)		7,200
Other (unclassified)		15,900
Kilometers of Railway <sup>n,c+Maps</sup>		1,700
<u>HEALTH STATUS</u>		
Life Expectancy at birth (years) <sup>m</sup>		
Male	41.8	44.3
Female	45.0	47.5
Crude birth rate (per 1,000 pop) <sup>m</sup>	47.7	49-(52)

<u>HEALTH STATUS (Continued)</u>	<u>1969</u>	<u>1976-77 or Most Recent Estimate</u>
Crude death rate (per 1,000 pop) <sup>m</sup>	20.0	19.0
Population growth rate (annual increase)	2.8%	3.0
Number of years for population to double	-	23
Infant mortality rate (per 1,000 live births)	141	127
Children 1-5 mortality rate (per 1,000) <sup>h</sup>		130-140
Nutrition		
Average Calories/day <sup>d</sup>		1,700
Average grams protein/day <sup>d</sup>		
Rural		40
Urban		53
Malnutrition <sup>j</sup>		
Inpatient admissions		12,630
Outpatient - new cases		39,900
Malaria		
Total number cases with malaria as main diagnosis <sup>j</sup>		656,000
Inpatient cases		66,000
Outpatient cases		590,000
Bilharzia (number patients treated) <sup>j</sup>	60,616 <sup>o</sup>	65,690
	<u>1972-3</u>	<u>1976</u>
Leprosy (prevalence rate/10,000 pop) <sup>j</sup>	37.70	36.49
Pulmonary TB <sup>j</sup> (prevalence rate/10,000 population ) <sup>j</sup>	25.51	27.76
Typhoid (total listed as notified disease in 1975) <sup>m</sup>		88
Cholera	No reported cases since 1970 <sup>e</sup>	
Measles (Total) <sup>j</sup>	153,116	128,218
Inpatient admissions	31,616	37,518
Outpatient first attendances	121,500	90,700
Percentage of deliveries attended (1974) <sup>h</sup>		37.5%

<u>HEALTH STATUS</u> (Continued)	<u>1972-3</u>	<u>1976</u>
Population Immunized (in millions) <sup>q</sup>		
TB	2.8	3.2
Measles	1.7	2.3
Polio	1.3	1.9
Diphtheria, Whooping Cough, Tetanus	1.2	1.7
<u>HEALTH RESOURCES</u>	<u>1972</u>	<u>1977</u>
Total health expenditure: recurrent and capital (government, missions and mines) (in U.S.\$ millions)	-	\$87.5-92.5
Per capita recurrent health expenditure (government, missions and mines)		\$15.88
Government health expenditures (recurrent and capital)		
Total (in U.S.\$ millions)	\$44.4	\$65.4
Per Capita (\$)	\$10.94	\$12.73
Government health expenditures (capital only)		
Total (in U.S. \$ millions)	\$ 8.1	\$6.3
As % of all government expenditures	3.7%	3.2%
Per capita (\$)	\$2.00	\$1.23
Government health expenditures (recurrent only)		
Total (millions of U.S.\$)	\$36.1	\$59.1
As % of all government expenditures	7.1%	7.5%
Per capita (\$)	\$8.12	\$11.13
Population per physician: Total	-	8,000
Rural	-	3,400
Urban	-	41,000
Population per nurse	-	1,200
Population per medical assistant	-	4,900
Population/health inspector/health asst.	-	9,700
Hospitals: Population/Bed and Cot <sup>i</sup>		357
Beds, cots per 1,000 pop		2.8
Urban (Population/Bed and Cot)		219
Rural (Population/Bed and Cot)		571
Community Water Supply (% Population Served) <sup>m</sup>		37%
In Urban Areas (1973)	75%	
In Rural Areas (1973)	10%	

UNITS OF VALUATION

The official unit of currency in Zambia is the Kwacha (K).

CURRENCY EQUIVALENTS

Prior to February 1973, the Kwacha was equal to U.S. \$1.40. From February 1973 to July 1976, the Kwacha was equivalent to U.S. \$1.55. Since then, the Kwacha has been the equivalent of approximately U.S. \$1.25, or K1 equals U.S. \$0.80.

FISCAL YEAR

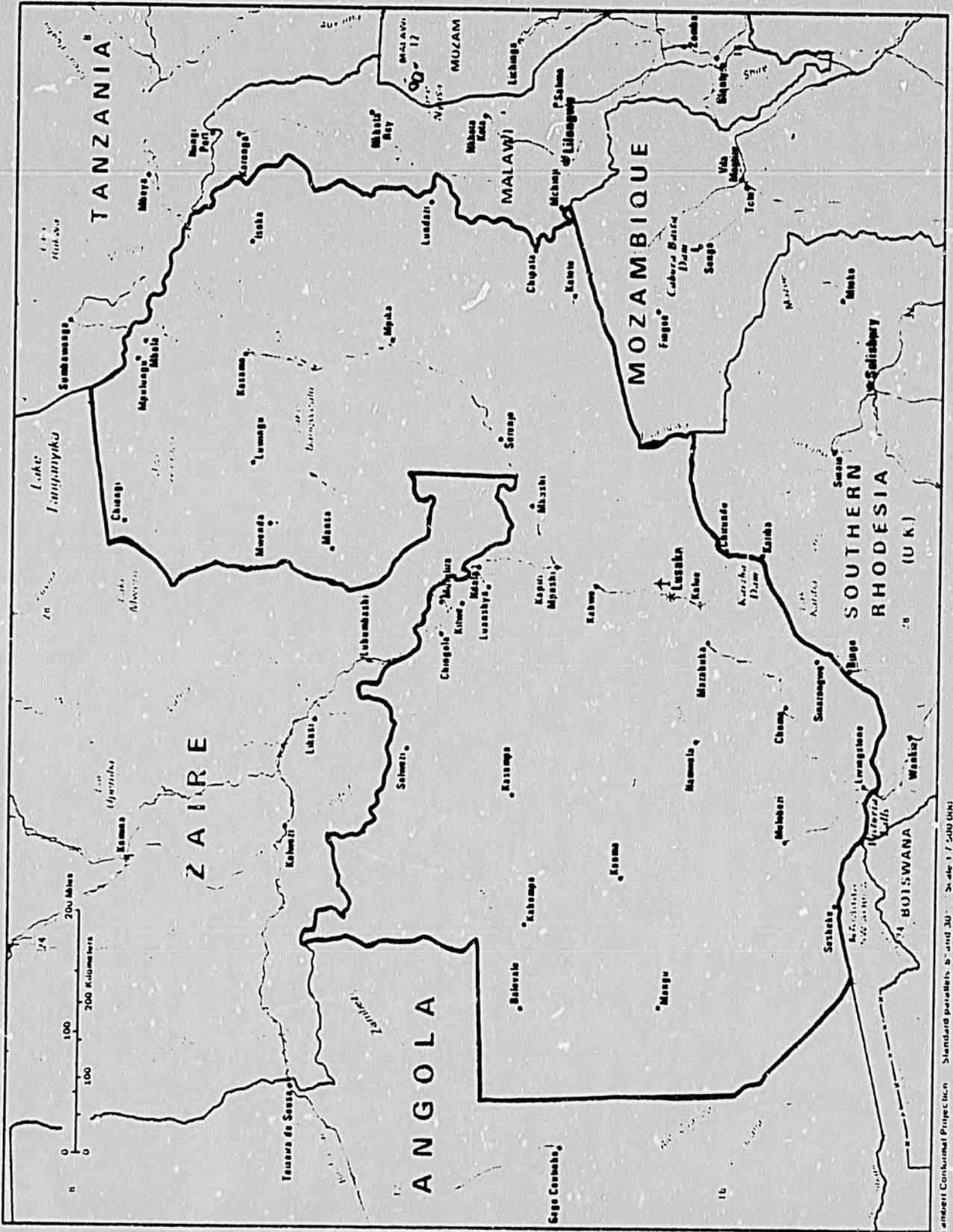
The government fiscal year runs from January 1 - December 31.

SOURCES FOR STATISTICAL SUMMARY

(Numbers refer to citations in Bibliography in Appendix.)

a = 1	m = 31
b = 2	n = 34
c = 4	o = For year 1972
d = 8	p = For year 1973
e = 20	q = Figures are estimates for numbers of people immunized. Numbers of doses administered is two to three times higher.
f = 24	
g = 25	
h = 26	
i = 27	
j = 28	
k = 30	

# Zambia



Standard parallels 8° and 30° Scale 1:500,000  
Lambert Conformal Projection

## II. A PROFILE OF ZAMBIA: THE CONTEXT OF HEALTH AND DEVELOPMENT

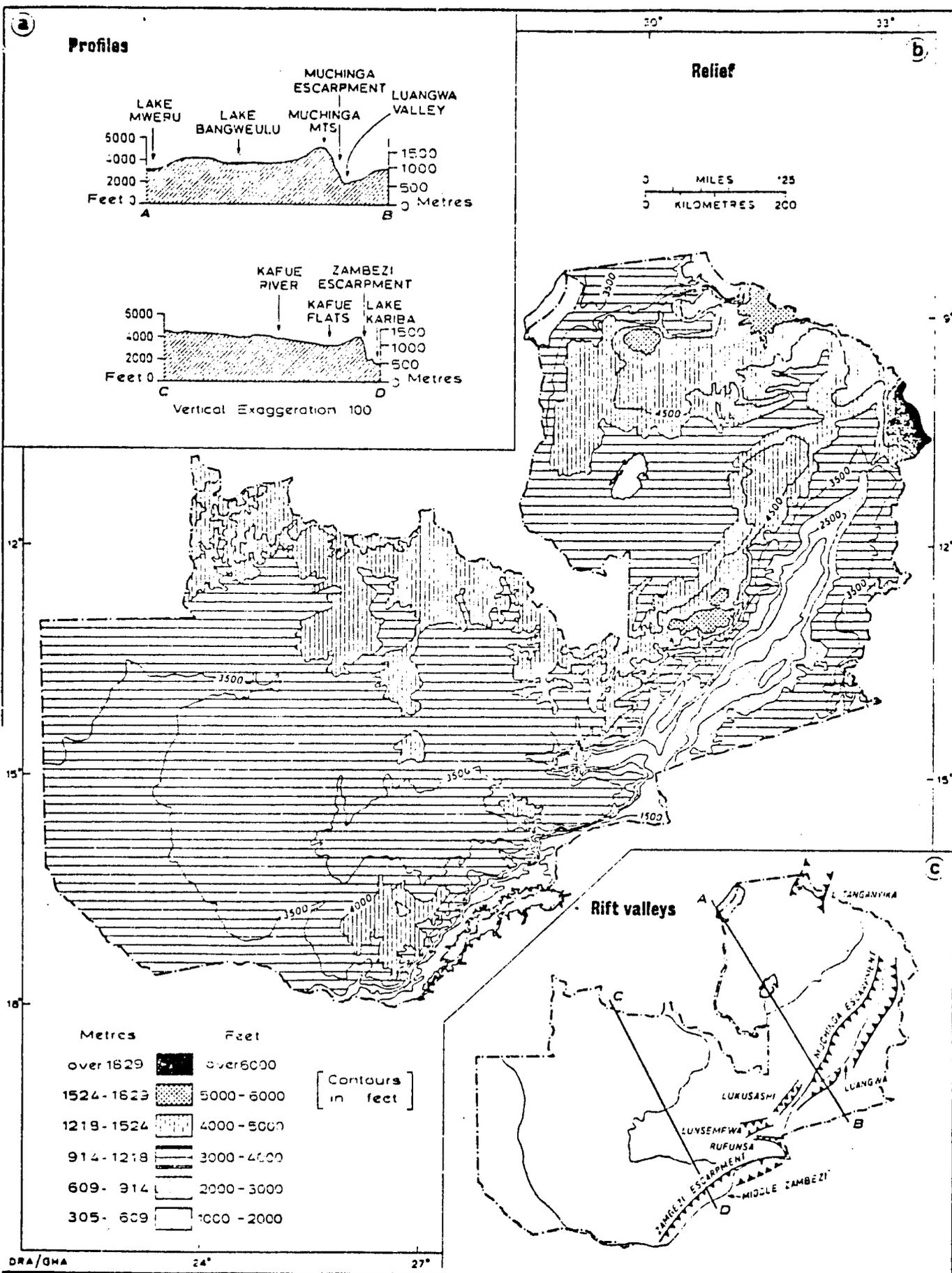
Zambia is a landlocked country whose boundaries divide traditional ethnic groupings and cut through natural ecological regions. The population is culturally heterogeneous, and this ethnic diversity has historically been a source of socio-political fragmentation. These factors, together with the large surface area and poor communication networks, have limited the development of natural economic and cultural units. Almost two-thirds of the population continues to live in rural areas where most are subsistence farmers. The urban population is centered in Lusaka, along the "line of rail", and in the copperbelt mining areas.

A generally favorable economic situation developed during the post-independence (1964) decade, but a drop in copper prices has seriously affected the balance of payments and the government's ability to finance development activities including health and social services.

### A. PHYSICAL FEATURES

Zambia covers an area of approximately 758,000 square kilometers, of which only one-third is well-suited to agriculture. Forests and game preserves account for about 15 percent of the land area, and about 10 percent is either permanently under water or excessively rocky. The relief of Zambia is mainly undulating and flat plateau between 900 and 1,300 meters above sea level which are occasionally broken by isolated hills or sharp escarpment zones.

PHYSICAL RELIEF AND PROFILES OF ZAMBIA



The plateau is highest in the northern, eastern, and copperbelt regions and gradually decreases towards the south and west.

Rainfall is greatest in the higher, northern plateau regions (annual average from 1015mm to 1520mm), and is least in the lower southern half of the country (annual average 635mm to 1015mm). The average length of the rainy season varies from more than 190 days in parts of the Northern and Luapula Provinces to less than 120 days in the middle Zambesi Valley. In general, Zambia's climatic cycle can be divided into three seasons:

- April-August - Cool and dry
- August to November - Hot and dry
- November to April - Wet and warm

The varying combinations of climate, topography and soil types give rise to four major ecological zones.

<u>Zone</u>	<u>Ecological Characteristics</u>
1. Northern (Major parts of northern, Luapula, Copperbelt and Northwest Provinces)	High plateau, high rainfall, soil of low fertility, large tsetse fly areas.
2. Western (Western parts of North-western Province)	Lowest, driest region, limited plant growth, part Kalahari desert, low agricultural potential, predominantly a cattle area.
3. Central (Central, southern and western plateau)	Agriculture zone, good soil, adequate rainfall, trypanosomiasis in southern and eastern areas.
4. Zambesi-Luangua Rift Valley (Divides East Province from others)	Low altitude, low rainfall, hot humid climate, generally not suited to agriculture.

B. DEMOGRAPHIC PROFILE

This subject will be covered in greater detail in Section III.A.5. Compared to neighboring countries, Zambia is sparsely populated. The estimated 1977 population is just over five million, and in rural areas there are only about four inhabitants per square kilometer. Three cities have more than 200,000 residents, and Lusaka has a half million inhabitants. The population is growing at about three percent per year and should reach ten million by the turn of the century. Industrialization, the creation of new job opportunities in the copper mines, urbanization, and education have contributed to a high rate of rural-urban migration over the past 20 years, causing a shortage of males in some rural areas and densely populated squatter settlements in several major cities.

More than 98 percent of Zambia's inhabitants are of African descent. Between 45,000 and 55,000 (about one percent) of its residents are of European ancestry and from 15,000 to 20,000 inhabitants are of Asian heritage, mostly from India and Pakistan.

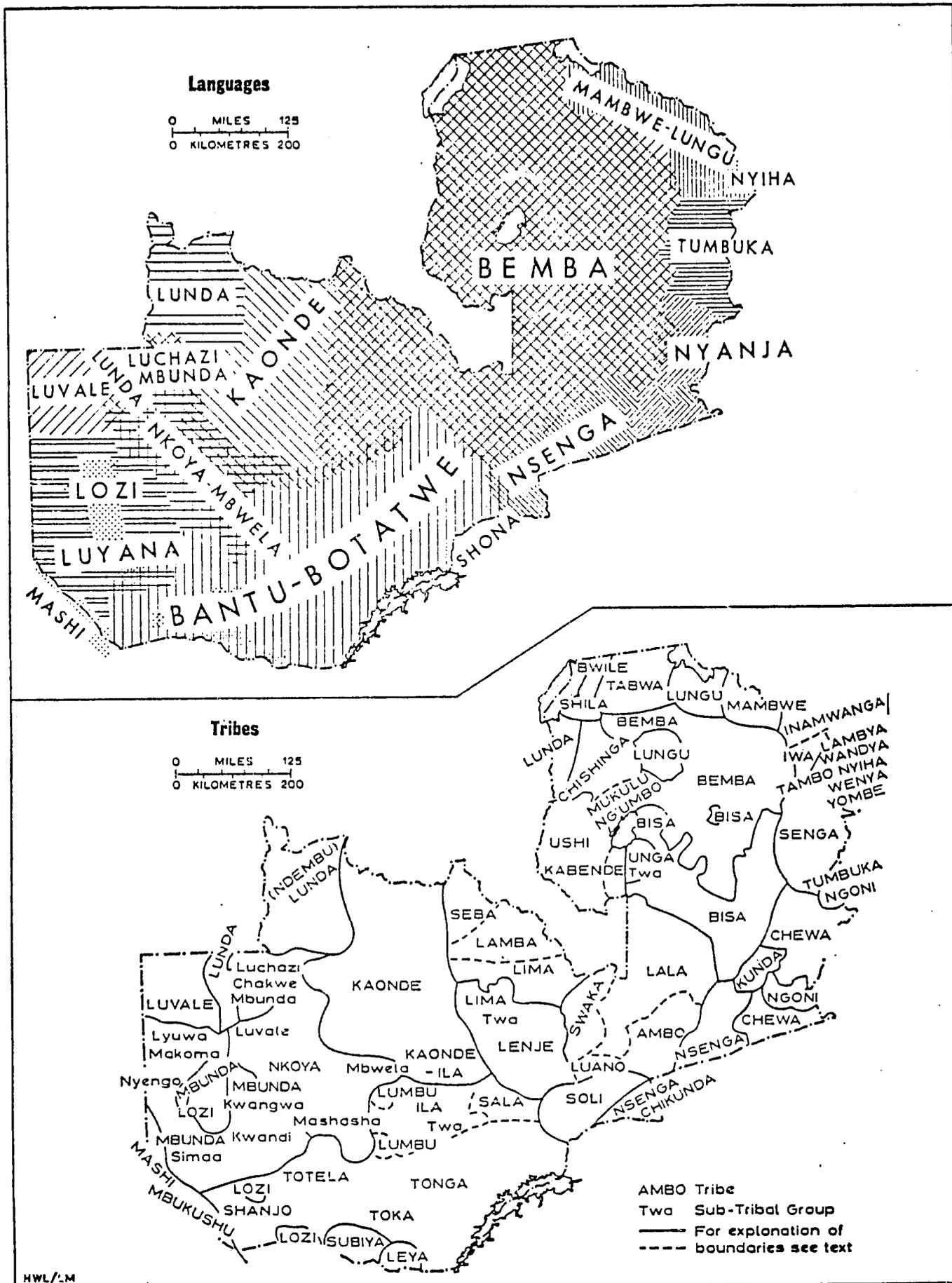
C. HISTORICAL AND CULTURAL CHARACTERISTICS

1. Historical Summary

Today there are more than 70 distinct ethnic-linguistic groups within the national boundaries of Zambia. Many have historical and cultural ties to neighboring tribes that currently reside in surrounding countries.

Evidence of early habitation of Zambia dates back to the early stone age, more than 15,000 years ago. A few of

DISTRIBUTION OF LANGUAGES AND TRIBES IN ZAMBIA



their descendants continue to live as hunters and gatherers in the Kalahari area. Ancestors of the present day Bantu-speaking tribes began to arrive in the area about 2,000 years ago and were primarily metal workers and cultivators. Major waves of migration from the Luba and Lunda empires of Katanga occurred from the 15th through the 18th centuries. These groups introduced centralized kingships as a form of social organization and stimulated long-distance trade. This migration pattern continued during the 18th century and a variety of socio-political units (variants of a centralized kingship model) emerged as independent entities frequently at war with one another. A different pattern emerged during the 19th century when the principal migrations (actually military invasions) were from the south into the southwestern and eastern areas. By the mid-19th century the tribes of Zambia occupied substantially the same area they do today.

During the middle of the 19th century Zambia was visited by western explorers, missionaries, and traders. David Livingstone saw Victoria Falls in 1855 and in 1888 Cecil Rhodes secured British commercial and political rights in the area from local chiefs. In the same year, Northern Rhodesia (now Zambia) and Southern Rhodesia were proclaimed British spheres of influence, and in the early 1900's a system of taxation was introduced. The imposition of taxes forced many villagers to migrate to mining areas in southern Rhodesia and the Congo and seriously affected agricultural

production in Zambia. The completion of the railroad and expansion of mining transformed the area. Towns were built, the population increased, and the availability of cheap land and labor led white settlers to establish large farms.

Until 1924, Northern Rhodesia was controlled primarily by the British South Africa Company. In that year it became a British Protectorate and was a relatively poor area controlled by white farmers and mine owners. Indirect rule using native chiefs was instituted in most rural areas and more direct colonial administration occurred in urban zones. In 1953, Southern Rhodesia, Northern Rhodesia, and Nyasaland (now Malawi) were joined into a Federation. This was followed by a decade of conflict over political authority between the African and white populations and by the emergence of political parties which demanded the dissolution of the Federation and political independence. In 1964, Northern Rhodesia became Zambia. Since independence, Zambia has been led by by President Kenneth David Kaunda.

## 2. Language and Ethnicity

There are more than 70 tribes and 40 languages spoken in Zambia today. In spite of a partial cultural-linguistic consolidation over the years, Zambia's ethnic diversity remains an important facet of social and political life. Only one tribe, the Tonga, has over 10 percent of the population, and at least seven major languages are used on a regional basis in primary schools and on Radio Zambia-Bemba, Tonga, Nyanja, Lunda, Luvale, Lozi, and Kaonde.

Tribal affiliation remains an important feature of cultural and social life and plays a role in the political and economic affairs of the country. Modern institutions, urban life, intertribal marriages, trade and political organizations are, however, reducing the importance of tribal affiliation.

### 3. Traditional Forms of Social Organization

Tribal groups in Zambia tend to be centrally organized kingships but differ internally in terms of the scope of authority of chiefs in political and economic affairs, and with regard to organizing principals of kinship and family life. Most tribes are matrilineal (not to be confused with matriarchal) in which succession to political offices and inheritance of property go from a man to his sister's son or sons. The extended family, lineages and clans are based on matrilineal descent. The lineage is an important organizing principal, especially in regard to marriage alliances. Polygyny\* is accepted as an ideal pattern among most groups in Zambia.

The Bemba and Tonga are matrilineal, although post-marital residence among the latter is with the husband's family (virilocal). A few groups in the eastern part (e.g., Mambwe and Ngoni) are patrilineal and the ruling group among some matrilineal peoples (e.g., Lunda in the Luapula

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\* Polygyny refers to having many wives.  
Polygamy refers to either sex  
having more than one mate.

Valley) are organized patrilineally. Bilateral descent (traced through both men and women) is found in the south-west among the Lozi.

#### 4. Social Structure

Tribalism, while still an important aspect of sociocultural life in Zambia, has been modified by historical and contemporary events. Sectional or regional ties are important today, as are class affiliations based on education, economic status and personal loyalties. Asians dominate the commercial and trading sector in Zambia and also are vital to the provision of health services. Most are recent migrants from the middle sector of the spectrum of the Indian class and caste system.

The white European population has always been numerically small, and until independence was politically and economically powerful. There is little unity among this group as a whole which is divided into farmers, managers, workers, and missionaries. They do, however, live in a world separate from other ethnic groups and maintain elements of British culture through social clubs and residential segregation.

While the policy of the government has been to encourage a united, non-racial society, a legacy of tribalism, colonialism, and social hierarchy continues to influence ethnic attitudes and social relations.

#### 5. Modernization and Changing Social Patterns

Since independence, Africans have assumed all important political positions and rely less on European advisors who,

in the early post-independence years, remained in key positions. In addition, Africans have moved into the commercial and shopkeeping roles previously almost exclusively run by Asians. Changes are most obvious in urban areas where the criteria for the evaluation of relative status is formed by degree of sophistication, education, type of occupation, and material possessions.

Changes in the rural area are more complex and difficult to describe since they involve a combination of tribal and modern values. The philosophy of Zambian Humanism articulated by President Kaunda is based on egalitarian principles, which is difficult to reconcile with both traditional forms of hierarchy and those of an emerging class system based on economic/educational differences.

Today, cash crop production in areas previously used for subsistence farming, the establishment of more permanent villages, and educational opportunities are modifying traditional forms of social organization. Health services of the government now spread throughout much of the rural territory, but it is difficult to evaluate their impact on traditional beliefs and practices.

D. THE POLITICAL SYSTEM

Since 1973, Zambia has been organized as a "one-party participatory democracy." The 1973 party and state constitutions establish a strong, centralized government and a unicameral parliament (National Assembly) with 136 members. The United National Independence Party (UNIP) is the sole legal party, and Kenneth Kaunda is President of the party and of The Republic of Zambia. The 25-member Central Committee of UNIP formulates National policy, which is then implemented by the Cabinet. The person selected to be President of the Party becomes the sole candidate for President of The Republic. The President selects the Secretary-General of the party, who becomes the second-ranking person in the government, and the Prime Minister. The President is selected by popular mandate to a five-year term. The Zambian Cabinet, including the Prime Minister, is appointed by the President from among those holding seats in the National assembly.

Zambia is politically divided into nine provinces (see Map following), each administered by a cabinet minister. Provinces are sub-divided into districts and districts are subdivided into wards. In addition, there are ten special urban districts. At each level there are committees for the Party (UNIP), the government (political), and development activities. District governors are appointees of the president with supervisory political functions. Most



development programs, including those in health, community action and education are administered by local representatives of the appropriate national department.

The organization of administrative and development activities at the provincial and lower levels is conducive to inter-departmental planning and cooperation. More study is needed, however, to determine how it actually functions.

President Kaunda has wide popular support and advocates a policy of "Humanism" which emphasizes egalitarian and cooperative principles and is sometimes referred to as a doctrine of "African Socialism." This policy or "humanistic" philosophy underlies government-programs for industry, agriculture, education, and health. A major component of the policy in all sectors is the "Zambianization" of professional, executive, administrative, technical, and other positions and involves the gradual replacement of expatriate manpower by nationals. Zambianization has proceeded swiftly since 1964, when nationals filled less than one-quarter of the positions in most categories. Today, Zambians occupy between 80 and 100 percent of the technical, executive and administrative posts in many fields, and are gradually increasing their percentage of professional positions that require a lengthy, specialized education.

E. THE ECONOMY

Zambia's economic system is divided into modern and traditional sectors. The modern sector is made up primarily

of mining, industrial production and commercial farming. The traditional sector is found in small-scale subsistence agriculture, fishing, and animal husbandry. Copper production accounts for 50 percent of Zambia's GNP, 96 percent of the value of its exports and, between 33 and 50 percent of the government's revenue. The sharp drop in world demand for copper since mid-1974 has seriously affected the economy, especially the balance of payments, and has reduced the government's capacity to finance development activities, including those in the health sector. Shortages of drugs, medical equipment, and replacement parts for Ministry of Health vehicles are attributed, in part, to the balance of payment difficulties.

The 1976 gross national product (GNP) is estimated to be about US \$ 2,393 million, with a balance of payments deficit of \$157 million. This is a major change from 1973 when there was a \$144 million balance of payments surplus, and it has forced the government to increase foreign borrowing--which already stood at \$1,184 million at the end of 1975. The annual rate of growth of the GNP averaged between 2.6 and 2.9 percent between 1965 and 1975, but declined to 1.5 percent in 1976.

A major objective of the government's policy is to use the country's mineral and industrial wealth to advance the economic and social welfare in a more balanced and equitable manner. This has led to government acquisition of majority

interests in copper and industrial firms and restrictions on the involvement of non-Zambians in commercial ventures. These moves have been accompanied by an intensive drive to "Zambianize" positions held by expatriates. The government is also striving to reduce the gap in living standards between the rural and urban areas and trying to diversify the economy to make it less dependent on copper.

F. AGRICULTURE AND LIVESTOCK

The agricultural sector, like the economy as a whole, is divided into modern and traditional sub-sectors. The modern portion is composed of large state and company farms and about 800 commercial farmers, while the traditional sub-sector has about 600,000 small producers. A growing group of "emergent farmers" occupies the middle ground between the traditional and modern sub-sectors. About 52 percent of the labor force in Zambia is involved in agricultural production.

Commercial farms are large, close to urban markets, and use modern, capital-intensive methods to produce cereals, poultry, eggs, beef, pork, milk, maize, tobacco, and cotton. Traditional farms are found throughout the country and produce limited quantities of surplus usually sold in local and area markets. Major crops are maize, millet, cotton, peanuts, and free-grazed beef.

Land is plentiful even after one excludes those portions which have limited agricultural potential and/or are inaccessible. Cattle grazing is limited by trypanosomiasis and other livestock diseases.

Zambia has good agricultural potential but much of it remains unexploited. Although it is generally self-sufficient in poultry, eggs, and maize, from 25 and 40 percent of marketed food is imported. Most imported foodstuffs could be produced in Zambia.

As urbanization increases, the demand for basic agricultural commodities will also rise. The overall food shortages contribute to malnutrition and related health problems. Although the government wants to encourage agricultural output, it has kept agricultural prices at a low level, which has depressed farmers' real income and discouraged investments. This policy is being altered.

#### G. INDUSTRY AND MINING

About 15 percent of Zambia's labor force is involved in industry and mining. The mining companies are major employers in Zambia and provide workers with a range of social and health services. Annual copper production has fluctuated between 586,000 and 748,000 tons since 1965, but with no distinct upward trend. Efforts to increase production have failed due to declining ore grades, transport difficulties, falling labor productivity, and other factors.

A combination of slow output growth plus rising real production costs implies that copper production will not contribute significantly to the expansion of real resources unless Zambia's terms of trade improve.

Non-mine, industrial production and expansion grew rapidly in the years immediately following independence but the rate of growth has slowed since 1970. Major manufacturing industries are:

- o food, beverage, and tobacco;
- o textiles and clothing;
- o wood, paper products, printing, and publishing;
- o rubber, chemicals, petroleum, and plastic products;
- o non-metallic mineral products; and
- o metals, machinery, and equipment.

Major problems in this sector are linked to the shortage of foreign exchange and transport rerouting.

The government has increased its role in manufacturing enterprises through government-owned holding companies (parastatals). Parastatal institutions have increased the public share of manufacturing output to over 50 percent, which is concentrated in large-scale, technologically-advanced plants producing essential goods. The Zambia Development Bank, Zambia Airways, cement, food processing, and mining are linked to the public sector through parastatal institutions.

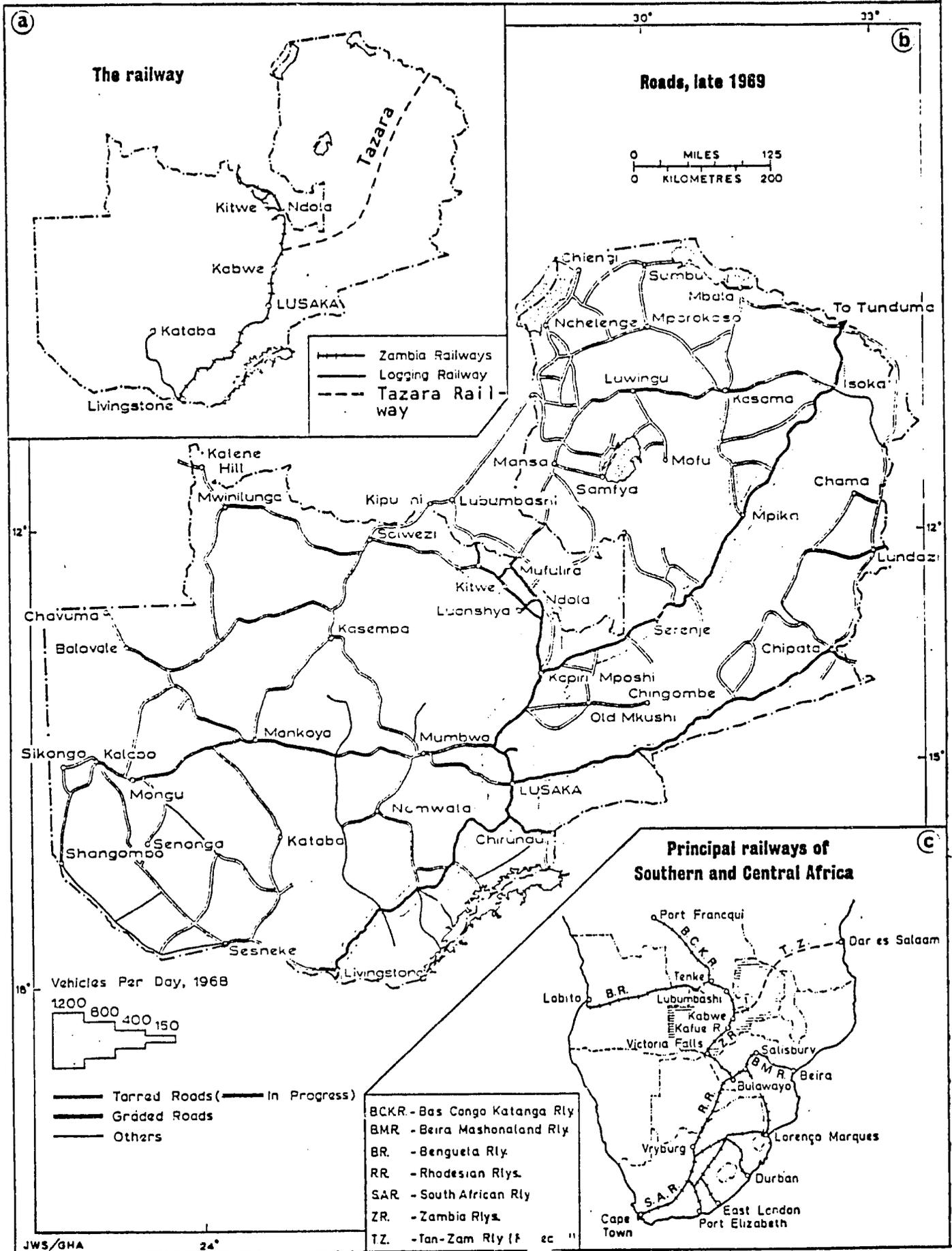
H. TRANSPORTATION

Zambia's landlocked position, together with the vital economic role of imports and exports make adequate transportation to the sea a vital factor in the economy. During the colonial period a good international and internal railway network developed, but within Zambia it was tied primarily to the North-South route where mineral resources are concentrated. The phrase "line of rail" is commonly used to refer to this region which is the most densely populated part of Zambia--from Livingstone in the south, through Lusaka and into the copperbelt in the north.

Traditional rail routes to the sea through Rhodesia and Angola have been closed because of political problems, and Zambia now relies heavily on the newly constructed Tanzania-Zambia (Tazara) railroad for transporting imports and exports. There are road linkages between Zambia and most of the neighboring countries, but they are of only fair-to-poor quality and play a limited role in the movement of goods and services.

Internally, Zambia has about 1,700 kilometers of railway (including Tazara), 35,000 kilometers of roads (one-third of which are paved or graveled), and a wide network of airports and landing strips. The good quality roads are concentrated in the regions along the line-of-rail, but the new national development plan calls for major improvements in the rural, secondary road system.

ROADS AND RAILWAYS IN ZAMBIA



The lack of vehicles to transport people and goods is a serious problem. Many buses, trucks, jeeps, and automobiles are out of service (perhaps 25 percent or higher) and cannot be repaired due to shortages of spare parts and trained mechanics. The lack of adequate land transportation presents a major obstacle to development and has limited the effectiveness of curative and preventive health services in both the urban and rural areas.

I. HOUSING

The 1969 census estimated the total number of houses in Zambia to be about 880,000. Approximately 80 percent of these were in rural areas and occupied by the owner's household. More than 96 percent of the dwellings were occupied by single households, and the remaining multiple family units were in urban areas. Adequate water supply and waste disposal facilities are lacking in homes in rural areas and among many squatter settlements in urban regions. There is a serious housing shortage in urban areas and approximately 300,000 people live in squatter settlements without adequate services. The conditions in these settlements can be viewed as contributing to above average rates of morbidity and mortality. The government has sponsored a variety of programs to provide housing, sanitation, health services, and transportation to these settlements.

J. EDUCATION

Since independence, Zambia has made major progress in developing its educational system at all levels. In 1964

less than 100 Zambians were university graduates and less than one percent had completed the full primary school course. Today, the University of Zambia has produced more than 1,000 graduates and has an enrollment of about 3,000. The development of the educational system has provided Zambia with the trained manpower to replace expatriates in most positions. Today, expatriates predominate only in the professions and skilled technical roles. Special attention has been given in recent years to vocational and technical education for agriculture, industry, and health. In 1976 there were 950,000 students enrolled in primary schools, 78,000 in secondary schools, and 3,000 in teacher training programs. The primary teacher pupil ratio is 1:40, and at the secondary level is 1:30. Approximately 17 percent of the total government recurrent expenditure budget is for education.

Future government plans in this sector emphasize the lengthening of basic education, reorienting secondary education towards more vocational content, and increasing the role of adult and non-formal education. In addition, strengthening the basic sciences in the primary and secondary schools as well as in teacher training institutions is high priority for the Zambianization of the medical profession. (Science is responsible for the majority of failures on the medical school entrance exam).

### III. THE HEALTH SECTOR

#### A. A PROFILE OF THE HEALTH SITUATION IN ZAMBIA

Zambia's mortality and morbidity profile reveal a very high percentage of death and illness from environmental and behavioral causes. Malnutrition, diarrhea, diseases of the digestive system, measles, and accidents account for a high percentage of health facility visits. Outpatient statistics indicate that Zambians average two illnesses and six visits per person per year.

During the past decade, major progress has been made in developing a country-wide network of hospitals and health centers. At the same time, while MCH services provided through these facilities have expanded rapidly, less attention has been given to the broader range of preventive care needs. Although health facilities are relatively evenly distributed with respect to population, under-staffing of rural facilities is prevalent and results often in their potential for providing preventive services not being realized.

##### 1. Health Status and Patterns of Morbidity and Mortality

###### a. Mortality

Reported deaths occurring at health facilities during the 1972-1975 period numbered approximately 65,000. About 85 percent of these were in hospitals, with the remainder occurring in health centers. Tables 1-3 provide some details of the mortality picture for a four year period. It should be noted that these data relate to less than 20 percent of all deaths.

Table 1  
MORTALITY IN HOSPITALS & HEALTH CENTERS, 1972-1975  
ZAMBIA

Year	Total Population	Total Number of Deaths	Hospital Deaths	Health Center Deaths	Rates per 1,000 Population	Share* of all Deaths (in %)
1972	4,525,000	14,741	12,134	2,607	3.3	16.4
1973	4,677,000	17,150	14,964	2,186	3.7	18.6
1974	4,829,000	17,193	15,036	2,157	3.6	17.8
1975	4,981,000	16,362	14,254	2,108	3.3	16.4
TOTAL		65,446	56,388	9,058	3.4	17.2

\* Based on a crude death rate of 20 per 1,000 population

Table 2<sup>31</sup>

TEN LEADING CAUSES OF HOSPITAL MORTALITY,  
ANNUAL AVERAGE , 1972-1975\*  
ZAMBIA

Rank	Mortality Cause	Number of Deaths	% of Total
1	Disorders of newborn & perinatal period	2,110	15.4
2	Malnutrition & Anaemias	1,600	11.6
3	Pneumonia	1,470	10.7
4	Measles	1,190	8.7
5	Gastritis, Gastroenteritis & other diseases of the digestive system	790	5.7
6	Dysentery/Enteritis & other diarrhoeal diseases	680	4.9
7	Accidents & injuries	650	4.8
8	Diseases of heart	580	4.3
9	Malignant Neoplasms & Leukemia	520	3.8
10	Malaria	510	3.7
	TOTAL DEATHS	13,730	100.0

\* There is a slight variance (between 5-10%) in the figures in Tables 2 and 3 and those found in references numbered 27-29.

Table 3  
 TEN LEADING CAUSES OF HEALTH CENTER MORTALITY,  
 ANNUAL AVERAGE , 1972-1975  
 ZAMBIA

Rank	Mortality Cause	Number of Deaths	% of Total
1	Measles	450	20.0
2	Pneumonia	360	16.1
3	Diarrhea	255	11.3
4	Malnutrition & Anaemias	255	11.3
5	Malaria	230	10.2
6	Other abdominal cases (including Jaundice)	90	4.1
7	Other pulmonary cases (URIs)	45	2.1
8	Injuries	40	1.7
9	Whooping Cough	25	1.0
10	Tuberculosis	25	1.0
	Yearly Average, Ten Major Causes	1,775	78.8
	Yearly Average, Health Center Deaths	2,250	100.0

The average annual death rate in health institutions is 3.4 per 1,000 population and represents only about 17 percent of the estimated total of deaths in the country from 1972 to 1975. Thus, it is difficult to make inferences from these data for the total population.

The ten leading mortality causes in hospitals account for almost 75 percent of all deaths; the ten leading causes in health centers account for almost 79 percent. During the 1972-1975 period, one quarter of all hospital deaths were due to infectious and parasitic diseases. More than 80 percent of all hospital deaths were among women and children. Nearly 50 percent of all hospital inpatients were children under 15 years of age, but they accounted for 70 percent of all hospital deaths during that period. Moreover, 50 percent of all deaths were among infants under one year old. The major causes of child mortality in hospitals were, in order of importance:

- o Diseases of the newborn/perinatal period
- o Respiratory diseases
- o Malnutrition and anemias
- o Measles
- o In 1975, tuberculosis replaced malaria as the tenth leading cause

The five leading causes of health center mortality (measles, pneumonia, diarrhea, malnutrition/anemias, and malaria,) remained relatively constant during the 1972-1975 period and

among them accounted for almost 70 percent of all deaths in these facilities.

b. Morbidity

Morbidity data are also reported statistics and bear an uncertain relationship to actual occurrences. They are classified into three major categories: those treated on an inpatient basis in hospitals, those treated in health centers, and those treated as outpatients. Table 4 presents a synopsis of major morbidity causes; more detailed statistical data are presented in Tables 5 and 6. During the 1972-1975 period, approximately ten percent of the population each year were inpatients in a hospital or health center. The overall morbidity rates for the 1972-1975 period do not indicate any clear evolutionary trend and average about 242,000 per year per 100,000 population (range 220,000-260,000).

There are some noticeable trends, however, as one focuses on individual provinces and/or on specific diseases. Some of these patterns are discussed in the paragraphs below.

The ten leading causes for hospitalization account for nearly 54 percent of all cases in hospitals and normal deliveries for another 17 percent. At health centers, the ten leading causes of inpatient admissions account for about 70 percent of the admissions. More than 40 percent of health center inpatients were diagnosed as suffering from

Table 4  
LEADING MORBIDITY CAUSES, ZAMBIA\*  
1972-1975

Causes**	Relative Ranking		
	In-Patient		Out-Patient
	Hospital	H.Center	New Cases
Upper Respiratory Tract Infections	10	5	1
Diarrhea	9	2	2
Accidents & Injuries	1	6	3
Malaria	2	1	4
Diseases of the Skin	-	-	5
Diseases of the Eyes	-	-	6
Diseases of the Ears	-	-	7
Worm Infestations (Bilharzia, Hook-worm, etc.)	-	-	8
Gastritis, Gastroenteritis & other diseases of digestive system	4	7	-
Diseases of the Teeth	-	-	9
Diseases of the Genitourinary system	7	-	10
Venereal Diseases	-	-	11
Malnutrition & Anaemias	5	10	12
Pneumonia	8	4	13
Measles	6	3	14
Disorders of Pregnancy/Delivery/Puerperium	3	-	-
Other Pulmonary Cases (incl TB)	-	9	-
Other fevers (incl sleeping sickness)	-	8	-

Compiled from Tables 6, 7, and 8 in Reference #1 (see Bibliography).  
Lack of diagnostic expertise and laboratory facilities are partially responsible for variations in classification system.

Table 5  
TEN LEADING CAUSES OF INPATIENT ADMISSIONS, ZAMBIA  
1973-1975 (ANNUAL AVERAGES)\*

Hospitals		Health Centers	
Cause	% of Total Admissions	Cause	% of Total Admissions
1. Accidents & injuries	9.3	Malaria	17.5
2. Malaria	9.0	Diarrhea	9.4
3. Disorders of Pregnancy/ Delivery/Puerperium	6.3	Measles	8.6
4. Gastritis, Gastroenter- itis/Other diseases of digestive system	4.5	Pneumonia	6.3
5. Malnutrition & Anaemias	4.3	Upper Respiratory Infections	6.3
6. Measles	4.3	Injuries & Accidents	6.2
7. Diseases of Genito- urinary System	4.1	Other Abdominal Cases (incl Jaundice)	5.0
8. Pneumonia	4.1	Other fevers (incl Sleeping Sickness)	3.9
9. Dysentery, Diarrheal diseases	3.9	Other Pulmonary Cases (incl TB)	3.5
10. Other diseases of Respiratory System	3.8	Malnutrition & Anaemias	3.4
TOTAL, 10 MAJOR CAUSES	54.0	TOTAL, 10 MAJOR CAUSES	70.1
Normal Deliveries	17.2	Maternity Admissions	7.5
TOTAL DELIVERIES & 10 MAJOR CAUSES	71.2	TOTAL MATERNITY & 10 MAJOR CAUSES	77.6

\* Compiled from Tables 9 and 10 in Reference #31 (see Bibliography).

TABLE 6<sup>31</sup>

INCIDENCES OF MAJOR MORBIDITY (NEW CASES) IN ALL  
HEALTH INSTITUTIONS IN ZAMBIA, TOTAL AND BY PROVINCE  
(PER 100,000 POPULATION), 1975

	Total Zambia	Central	Copperbelt	Eastern	Luapula	Northern	North- Western	Southern	Western
Upper Respiratory Tract Infections	27,073	29,050	35,873	22,830	19,376	15,591	33,341	32,697	17,638
Diarrhea	19,142	19,462	25,982	13,197	18,157	14,287	22,218	20,635	15,189
Injuries	18,315	20,070	25,407	12,215	14,441	13,781	17,321	21,660	10,816
Malaria	11,940	5,865	5,357	13,825	16,599	13,438	19,195	17,082	22,211
Diseases of the Skin	9,342	8,578	10,083	12,552	7,023	7,653	13,829	8,396	7,654
Diseases of the Eyes	8,999	6,976	8,500	7,585	8,934	9,159	10,732	11,222	12,365
Diseases of the Ear	3,834	3,475	4,687	3,735	2,277	2,268	4,634	4,894	4,116
Worm Infestations	3,411	2,468	3,966	5,107	3,248	2,624	6,166	2,414	2,709
Diseases of the Teeth	2,609	1,905	3,055	2,496	2,036	1,740	2,776	4,263	2,647
Genitourinary Diseases	2,549	2,907	4,499	1,087	1,777	1,534	2,585	2,285	1,176
Venereal Diseases	2,259	3,403	2,899	1,392	1,573	1,389	2,033	2,425	998
Malnutrition & Anaemias	1,699	1,254	1,443	1,591	3,942	2,122	2,027	1,165	1,626
Pneumonia	1,376	1,036	955	2,051	1,152	1,264	2,584	1,462	1,758
Measles	1,310	1,818	1,687	781	981	897	856	1,498	827
TOTAL MAJOR CAUSES*	113,859	108,268	134,391	100,444	101,515	37,748	140,297	132,098	99,730
TOTAL ALL CAUSES	178,186	169,796	214,476	150,893	166,393	140,933	225,216	198,258	150,147
Estimated Population	4,981,000	994,000	1,127,000	594,000	351,000	602,000	267,000	561,000	485,000

\* Excluding diseases given under the heading "other", e.g., other abdominal cases, other fevers, etc. or unknown causes

Source: Tables on Morbidity and Mortality in Health Institutions, 1975.

malaria, diarrhea, measles, or pneumonia. Approximately one of four hospital admissions and one of four hospital fatalities were due to infectious and parasitic diseases. The relative importance of the 14 major morbidity causes seems to be stable. They account for 54 percent of all morbidity in the country as a whole, ranging from 61 percent for Luapula Province to 67 percent in the Southern and Eastern Provinces.

The major morbidity causes for the entire country are upper respiratory infections (15.2%), diarrhea (10.7%) and injuries (10.3%), followed by malaria (6.7%), and diseases of the skin and eyes. Together, these six causes account for over 50 percent of the reported morbidity.

## 2. Communicable/Preventable Diseases, Accidents

Data presented below are from the MOH statistical unit. However, the actual prevalence of major diseases is probably higher than the figures indicate.

### a. Tuberculosis

Pulmonary tuberculosis is a major preventable disease in Zambia. The reported prevalence rate for pulmonary TB increased from 25.5 (per 10,000 population) in 1972 to almost 27.8 in 1976. Inpatient admissions for the disease were almost 5,000 in 1976, and 13,437 persons were on the outpatient register. In comparison to pulmonary tuberculosis, non-pulmonary TB has a rather low prevalence in Zambia - 2.94 (per 10,000) in 1976.

b. Leprosy

Because of its prevalence and chronicity, leprosy is an important health issue in Zambia. The disease affects all age groups and both sexes, but is more prevalent in rural areas where people delay visits to health facilities. These delays increase the spread of the disease and make the tracing of contacts extremely difficult. MOH statistics on leprosy indicate a slight but steady decline in the number of leprosy inpatients and in direct notifications received. The known prevalence in 1976 was 18,748, which translates into an estimated rate of 36.49 (per 10,000 population), a rate which is higher than that of tuberculosis. There is, however, significant regional variation in the prevalence of leprosy. In the western provinces prevalence is three times the national average, and in Luapula and northwestern provinces it is almost double the national average.

c. Malaria

Malaria is one of the most debilitating diseases in Zambia, affecting all age groups. It is among the leading causes of morbidity in inpatient and outpatient facilities and among the five leading causes of mortality in health centers. The reported incidence of malaria has risen progressively since 1968 and over a four-year period (1972-1975) malaria accounted for 9 percent of all hospital admissions and over 17 percent of health center admissions.

Between 5 percent and 8 percent of all outpatient visits receive malaria treatment, and in some rural facilities this averages between 10 percent and 20 percent of all visits, sometimes higher. In 1976, 66,000 inpatients and more than 590,000 outpatients were treated for malaria as a main diagnosis. In addition, a large proportion of patients whose main diagnosis is other than malaria, have malaria parasites in their blood which often contribute to their overall ill health and inhibit their ability to recover from other maladies.

d. Meningitis

Direct notifications of meningitis are severely under-reported in Zambia. For example, direct notifications in 1972 listed 10 cases and four deaths; yet, for the same year, hospitals alone reported 826 cases and 244 fatalities. The number of hospitalizations for meningitis was 831 in 1973, and rose dramatically to 1,262 (including 417 deaths) in 1974 and to over 2,000 in 1975. In 1976, the figure dropped to 1,673. Meningitis appears to be most prevalent in the densely populated areas, especially Lusaka, Livingstone, the Copperbelt, and along the line-of-rail.

e. Poliomyelitis

Although several million babies and children have received a first dose of polio vaccine, almost half fail to return for second doses, and only half of these for the final dose. Thus, only about 25 percent of those who begin

the series of vaccinations are actually fully protected against the disease. The number of reported polio cases (both acute and late effects) has dropped from 613 in 1972 to 452 in 1976.

f. Measles

Measles is a major health problem in Zambia and leads all other diseases as a cause of mortality in health centers. In 1976, hospital admissions for measles were 4.7 percent of all admissions and 11.1 percent of hospital deaths. For health centers, measles were responsible for 10 percent of inpatient admissions and caused an alarming 23.6 percent of health center deaths. During 1976, the total number for all categories of patients with measles amounted to 128,000. Furthermore, the number of persons infected has gradually increased over the past few years.

g. Trypanosomiasis

The incidence of sleeping sickness in Zambia is relatively low compared to other infectious diseases. However, the distribution of the tsetse fly vector has spread to new areas. Records kept by the MOH on sleeping sickness seem limited to direct notifications and hospital inpatient admissions, and the real prevalence may be much higher than the figures indicate. The number of direct notification cases dropped from 394 in 1972, to 95 in 1976 and, during the same period hospital inpatients declined from 517 to

120. Trypanosomiasis is most prevalent in Eastern Province but in recent years has spread to parts of the Northern and Northwestern Provinces.

h. Bilharzia

Bilharzia is widely prevalent in Zambia, and even in Lusaka new pupils examined in several schools showed a 25 percent rate of infection. The rate is significantly higher in many rural areas. First-attendance outpatients treated for the disease in 1972 numbered approximately 57,500 and increased steadily through 1976 when the figure reached 62,463. Inpatient admissions for the disease remained relatively stable at around 3,250.

i. Respiratory Diseases (excluding TB)

Respiratory diseases including upper respiratory tract infections, influenza, bronchitis, and pneumonia are the leading causes of morbidity in Zambia and among the leading causes of mortality, especially among children. In 1976, more than 73,000 inpatients and nearly 1,900,000 outpatients were treated for respiratory diseases, which were also responsible for almost 2,500 deaths in health institutions.

j. Gastro-intestinal Diseases

These diseases are among the leading causes of mortality and morbidity in Zambia, especially among children. They account for between 8 and 14 percent of inpatient admissions and between 16 and 19 percent of outpatient services. Inpatient admissions were 58,400 in 1976 and

1,160 persons died in hospitals and health centers due to gastrointestinal illnesses. Outpatient attendance for these diseases totalled 1,800,000.

k. Accidents and Injuries

Accidents and injuries account for between 5 and 10 percent of inpatient admissions and between 10 and 12 percent of outpatient visits. Health facilities in Zambia treated over one million patients for accident-related injuries during 1976. A significant number of injuries are due to motor vehicle accidents, assaults, and alcohol related fights.

l. Regional Variations and Diseases

A full listing of regional variations of major diseases can be found in Tables 6 and 7. This section is a short summary of this and other relevant data. The overall pattern reveals that the major variations occur between the most densely populated urbanized provinces along the line of rail and more rural sectors where the population has less access to health facilities. The Provinces along the line of rail, Central (which includes Lusaka), Copperbelt (cities of Kitwe and Ndola) and Southern, have in relative terms the highest prevalence of upper respiratory tract infections, diarrheas, injuries, genito-urinary diseases, venereal disease, meningitis and measles. These same provinces are among the lowest in rates of malaria, eye diseases, bilharzia, hookworm, malnutrition, and pneumonia.

Table 7  
 REGIONAL VARIATIONS IN MORBIDITY IN ZAMBIA\*  
 (H = Highest Incidence; L = Lowest Incidence)

Cause	Provinces							
	Central	C.Belt	East	Luapula	N	NW	S	W
Upper Respiratory Infection	H	H	-	L	L	H	H	L
Diarrhea	H	H	L	H	-	-	-	L
Injuries	H	H	L	L	-	L	H	L
Malaria	L	L	H	H	H	-	-	H
Diseases of the Skin	-	L	H	L	-	H	L	-
Diseases of the Eyes	L	L	-	-	H	L	-	H
Diseases of the Ear	-	-	H	L	L	-	H	H
Worm Infestations	L	-	H	-	-	H	L	-
Diseases of the Teeth	L	-	-	L	L	L	H	-
Genitourinary Diseases	H	H	L	-	-	-	-	L
Venereal Diseases	H	H	L	L	=	L	H	L
Malnutrition & Anemia	L	L	-	H	-	-	L	-
Pneumonia	L	L	H	-	-	H	-	H
Measles	H	H	L	-	-	L	H	-

\* Based on data in Table 6.

Malaria is most prevalent in the Luapula, Eastern, Northern, and Western Provinces, and the latter three also show the highest prevalence rates for pneumonia.

The leprosy rate for the Western Province is three times the national average, and in Luapula and Northwestern Provinces it is nearly double.

### 3. Food and Nutrition

The health status of any population is to a large extent related to nutritional status and to the sanitary conditions of cities, towns, and individual homes. National and regional statistics regarding food consumption, while providing a general comparative picture, must be used with caution, since there are often significant inequalities of distribution and consumption within communities and in households. In some areas, adult men have priority during meals, and women and children consume what remains after the men have finished.

#### a. Diet

In 1970-1971 the UNDP and FAO supported a survey project (National Food and Nutrition Programme: Zambia) to identify patterns of food consumption, nutritional status, and related health problems, and to suggest a strategy for a national nutrition program. According to this study the diet of the average Zambian is heavily dependent on cereal and root staples--maize, millet, cassava, sorghum, and rice;

over 80 percent of the calorie intake is from these sources. Consumption of vegetables is at a high level throughout the provinces, but consumption of fruit is low (except in the Eastern Provinces). Eggs, milk, fats, and oils also show low intake levels except in the Western Province where cattle are the basis of the local economy. In four of seven provinces surveyed fish is a major source of protein and much more important than meat in the local diet. Annual per capita food consumption is presented in Table 8.

The average per capita daily requirements of the population are estimated at about 2,050 calories and 26 grams of reference protein. The survey indicated that the average calorie intake was about 1,720 for the country as a whole, ranging from a low of 1,580 in the Northwestern Province to a high of 1,950 in the Copperbelt. There is, therefore, an overall deficiency of calories of about 20 percent when compared with the 2,050 figure cited as the daily requirement. In addition, the fact of unequal food distribution and consumption means that a high percentage of individuals consume 30-45 percent fewer calories than the desirable level. Some protein deficiency was recorded but was secondary in importance compared to the general deficiency of food intake in terms of energy sources.

Table 8  
AVERAGE ANNUAL FOOD INTAKE PER CAPITA BY PROVINCE (kg)  
ZAMBIA

	Northern Province	Eastern Province	Central Province	Copperbelt Province	NW Province	Western Province	Southern Province
Staples	176.5	126.4	169.6	138.6	209.0	210.9	151.6
Maize	25.6	121.7	143.9	92.0	53.1	107.9	137.0
Finger Millet	38.1	2.4	3.8	-	4.5	-	-
Sorghum	0.6	1.2	10.6	34.8	41.7	19.8	13.9
Rice	0.7	0.6	0.4	0.1	0.7	0.3	-
Cassava	111.5	0.5	10.9	11.6	109.9	82.9	0.8
Other Starchy Roots	3.9	-	1.9	0.8	17.4	8.5	3.2
Sugar	0.4	0.6	1.2	0.4	1.3	2.3	1.3
Pulses	7.2	1.2	1.5	0.5	3.7	0.5	0.8
Groundnuts	3.3	5.9	1.3	0.7	1.8	1.3	10.8
Vegetables	28.0	28.4	27.6	46.8	41.9	28.1	62.7
Fruits	2.0	35.4	4.0	2.8	3.9	10.3	6.1
Meat (as fresh)	9.8	22.0	13.8	4.2	22.8	18.5	23.3
Domesticated	2.9	13.7	6.4	3.2	7.4	18.5	21.5
Other	6.9	8.3	7.4	1.0	15.4	-	1.7
Eggs	0.1	0.1	0.5	0.3	0.1	0.1	0.1
Milk	0.3	1.3	4.6	-	0.4	9.5	3.5
Fish (as fresh)	34.3	11.4	36.0	32.4	21.3	50.3	9.4
Fats & Oils	0.4	0.5	0.8	3.1	0.6	0.1	0.1

b. Malnutrition

Malnutrition, though declining in importance as a health problem according to outpatient statistics (Table 9), accounted for over 12,500 hospital and health center admissions, and over 1,500 fatalities from malnutrition occurred in these institutions. About 40,000 outpatients were treated for nutritional deficiencies in 1976, although this figure represents a substantial decrease from 1972 when over 65,000 persons were treated for malnutrition.

The main disorders related to nutrition were:

- protein-calorie malnutrition (PCM);
- anemia;
- Hypovitaminoses A and riboflavin and;
- parasitic infections.

Among infants and children up to four years of age the main problem was protein-calorie malnutrition (primarily calories). Marasmus exceeded kwashiorkor, and growth retardation began at four to six months of age. Anemia was also found to have a high prevalence in this age group, due probably to iron deficiency and malaria. Also, anemia is usually associated with parasitic infections such as malaria, hookworm, and bilharzia. In the 5-15 year age group severe PCM is uncommon, though the fact that it sometimes occurs suggests there is a more general problem of undernutrition.

Table 9

**MALNUTRITION: HOSPITALS  
(ZAMBIA)**

	1972	1973	1974	1975	1976
Inpatient Admissions	7,390	7,640	7,920	8,150	9,520
Inpatient Deaths	1,040	1,190	1,170	1,090	1,450
Case-Fatality (Deaths per 100 Admissions)	14.0%	15.6%	14.8%	13.4%	15.2%
Outpatient First Attendances	15,500	11,200	12,600	11,800	9,500

**MALNUTRITION: HEALTH CENTERS  
(ZAMBIA)**

	1972	1973	1974	1975	1976
Inpatient Admissions	3,360	2,560	2,690	2,930	3,110
Inpatient Deaths	118	104	11	102	147
Case-Fatality (Deaths per 100 Admissions)	3.5%	4.1%	4.2%	3.5%	4.7%
Outpatient First Attendances	50,200	35,800	33,600	35,500	30,400

The percentage of underweight children visiting children's clinics was almost 7 percent in 1974 and increased to 12 percent in 1975.

4. Environmental Health Issues

a. Housing

Poor housing conditions are considered by most observers to be a contributing factor to poor health status. In Zambia, this generalization is probably more applicable in the urban context where a shortage of housing has increasingly led to multiple-family households and crowded shanty towns which lack basic water, sewerage, and sanitation services. In rural areas, homes are spread out, separate buildings have distinct functions (e.g. sleeping, cooking, storage), and new units are built more easily and inexpensively with local labor and materials.

According to the 1969 census, there were almost 900,000 dwelling units in Zambia, 80 percent of which were privately owned. About half of these homes were made of poles, grasses and mud, while the other half (including 90 percent of the urban structures) had more permanent walls of sun- or kiln-dried bricks or concrete blocks. Asbestos, corrugated iron, and other modern materials are found mainly in urban settings.

b. Water

The availability of an adequate supply of uncontaminated water is vital to the health of any population. In 1973 approximately 75 percent of the urban and 10 percent of the rural population had access to piped water systems. The estimated number of wells in rural Zambia in 1977 is between 2,500 and 3,000. In addition, there are between 1,400 and 1,700 boreholes in rural areas. The 1974 ILO advisory commission calculated that about 19 percent of the urban households (about 48,000) and about 44 percent of the rural households did not meet the minimum required need for an adequate water supply.

The lack of adequate treatment of water from lakes and slow-moving streams contributes to the high prevalence of bilharzia and other parasitic infections. Many wells and boreholes need occasional chlorine treatments, boreholes need a pump maintenance program and most wells are uncovered.

c. Sanitation, Waste Disposal

There are 15 sewerage systems in Zambia. The largest are in the cities of Lusaka, Ndola, and Kitwe. In all, slightly more than half of Zambia's urban population is served by a sewerage system. Only four of the 34 rural councils surveyed (1969 data) had a water-borne sewerage systems. Table 10 summarizes the percentages of the population with sanitation/sewerage facilities in 1969.

Table 10  
WASTE DISPOSAL METHODS AND FACILITIES, ZAMBIA

Type Facility	% of Urban Population	% of Rural Population
Flush Toilet	57.5	3.5
Septic Tank/ Aqua Privy	7.0	0.5
Pit Latrine	26.5	33.5
Bucket Service	2.0	-
None	7.0	62.5
	100.0	100.0

Assuming that a good pit latrine is a minimal standard for sanitation, a 1974 I.L.O. commission calculated that 28,000 urban households and 430,000 rural households did not meet this minimum level. In addition, in view of the large growth rate of urban areas, the government must continue to rapidly expand services just to maintain the current level of sewerage and sanitation facilities.

Lusaka sewerage is treated by two conventional treatment plants and three stabilization ponds. The quality of treatment is good. About 180,000 people are served by these facilities and one is being enlarged. However, much of Lusaka is not served by the sewage system and is dependent on either pit latrines or the collection of fecal material by municipal trucks. Sewerage systems in Ndola and Kitwe cover only parts of the cities but are rapidly being expanded.

Pit latrines are the most common type of facility in rural areas, and efforts are being made to increase the numbers and explain their utilization and importance. The program, however, has had difficulty because the required behavioral changes, in addition to cost and labor factors, sometimes conflict with local customs and beliefs. Even after construction, many latrines are underutilized and inadequately maintained.

Rat infestations present another environmental health hazard that in some densely populated areas is increasing in severity.

d. Occupational Health

The major occupational health issues are those related to work in the mines. The mines run their own hospitals and medical services, and provide relatively thorough coverage and detailed reports. Mine-related accidents are one of the principal causes of hospital admissions in the Copperbelt (between 800 and 1,000 in 1977) and were cited as the direct cause of 22 fatalities. The incidence of pneumonia among underground employees (13.83/1000) is more than twice the rate for those working on the surface (6.55/1000). Fungal infections and chronic bursitis ("Dunlop foot") are foot problems encountered among underground workers and viewed as serious problems by local health authorities. Additional occupational health issues include industrial deafness, dental erosion caused by acid fumes, and localized high concentrations of lead and sulphur dioxide.

5. Population and Family Planning Issues

Zambia's estimated population in 1977 was 5,138,000 and should reach about 10 million by the year 2000. The current size and growth rate of the population do not constitute a problem in terms of available land resources but do significantly add to the government's difficulties in providing adequate educational, social, and health services.

Approximately two-thirds of the inhabitants live in rural areas, but in view of migration and urbanization

trends, the rural/urban ratio should be about 1.0 by the mid-1980's when the population reaches almost 7.5 million (half living in urban areas).

Population density averages 7 per square kilometer for the country as a whole but is only 4 per square kilometer in the rural areas. By comparison, the overall population density in Malawi and Tanzania are 43 and 17 per square kilometer, respectively. In Zambia, the Copperbelt Province is the most densely inhabited (40 persons/km<sup>2</sup>) and the Northwestern Province the lowest (3 persons/km<sup>2</sup>).

The annual rate of population growth has slowly increased during the past decade (from 2.9 to about 3.1 percent), and the age distribution pyramid is characteristic of populations with high and constant fertility and a high but declining mortality. The statistics on population are shown below:

Age Distribution (1969 census)

<u>Age Group</u>	<u>% of total</u>
0-14	45.8
15-44	40.3
45-59	9.3
60 +	4.6

Vital Statistics Trends

	<u>Average for 1969-1974</u>	<u>Estimated Average for 1975-1979</u>
Crude birth rate/1000 population	49	(49-52)
Crude death rate/1000 population	20	19
Growth rate/100 population	2.9	3.0

Life expectancy is increasing for the population and is presently between 40 and 45 years for males and about 47-48 years for females.

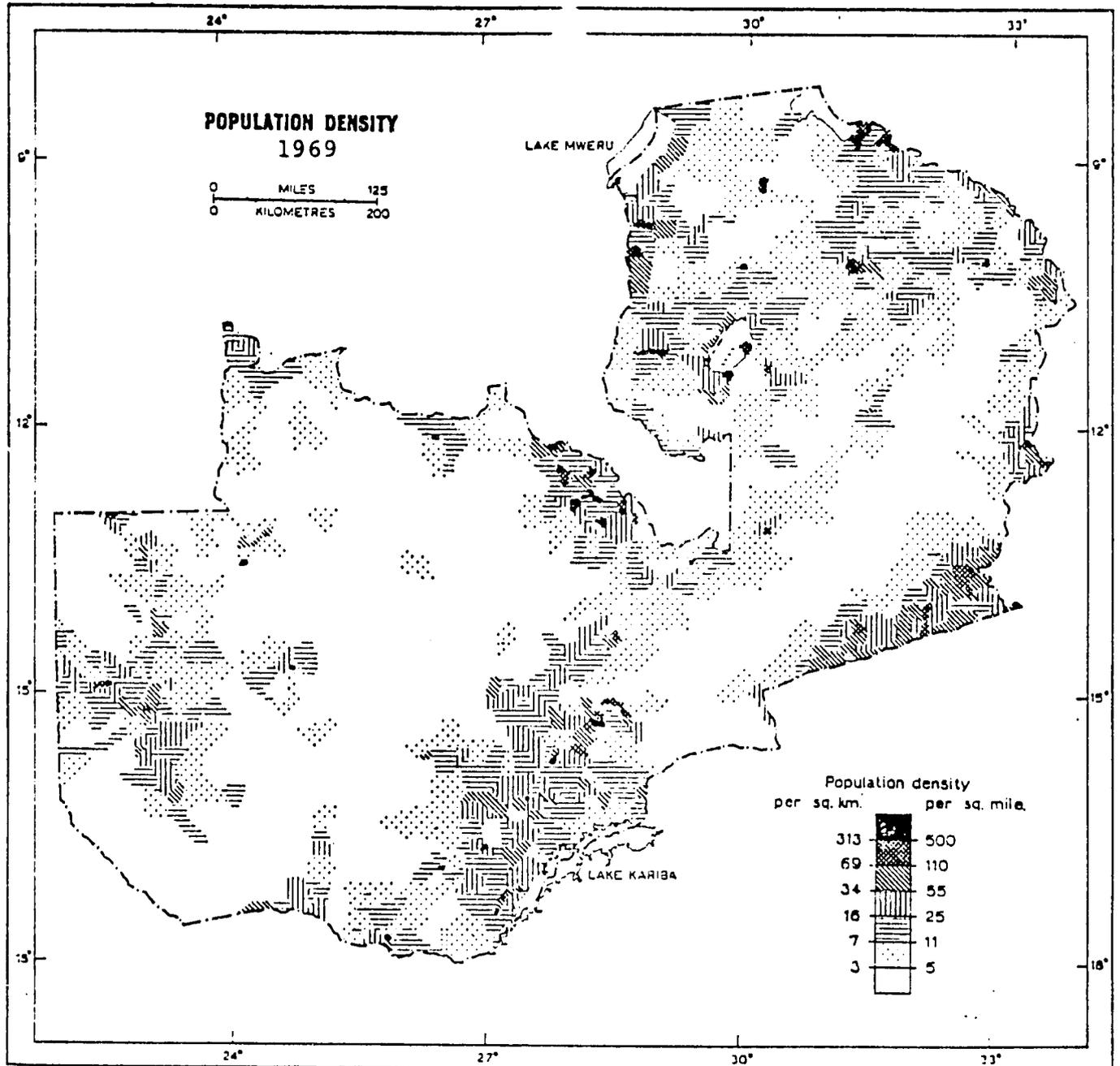
In 1976 about 65 percent of Zambia's population lived in rural areas with the remainder in large cities and townships (see map on the following page). The major urban centers (1975 figures) are:

Lusaka	-	415,000
Kitwe	-	310,000
Ndola	-	222,000

The urban population has grown by an average of 8-12 percent per year since 1964, with the cities listed above increasing at the fastest rate. If one takes present growth rates and migration trends into account, the rural/urban ratio should shift to a 1:1 ratio in the mid-1980s when Zambia's population reaches almost 7.5 million.

The tendency of males to leave rural areas for jobs in the mines and cities has led to a shortage of male manpower in some of the rural areas and a dramatic imbalance in the sex ratio in both urban and rural regions. In some rural areas of Zambia there are less than 70 males for every 100 females, while in the Lusaka-Copperbelt area the number of males exceeds the number of females by 10 to 20 percent. Research also indicates that the most educated young males are most likely to migrate from rural areas.

### POPULATION DENSITY IN ZAMBIA 1969



In rural areas, the distribution of population among more than 24,000 villages, including over 14,000 with less than 50 inhabitants, makes it difficult to provide even minimal health services in some areas. In urban settings, the high rate of growth due to births and immigration make it hard even to maintain the present level of services.

In Zambia, groups targeted by MCH services (including ante-natal clinics) constitute approximately 70 percent of the population.\* In 1974 about 40 percent of births were done under medical supervision, and in 1975 more than 50 percent of pregnant women were admitted to health facilities for pregnancy/birth-related causes. Infant mortality averaged about 127 per 1,000 live births during the 1975-1976 period. In 1973 the still-birth rate in health facilities was 3.5 percent, the neo-natal fatality rate was 2.7 percent, and about 7.6 percent of women admitted for deliveries lost their babies.

Elective abortion is forbidden, but there is a Termination of Pregnancy Act (No. 26, 1972). A medical abortion is permitted if three registered medical practitioners in a hospital agree that continuation of the pregnancy would involve a serious risk (physical or mental) to the mother and/or when the child is likely to be born "seriously handicapped."

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\* Children 0-14 years and females of child-bearing age (15-49 years).

Under-fives clinic attendances increased from less than 500,000 in 1969 to over 1.8 million in 1973. Approximately 50 percent of the under-five population of Zambia has attended one of these clinics. Attendance at ante-natal clinics listed 180,000 "new" cases in 1973 -- about 75 percent of the number of pregnancies.

6. Special Problems

The unstable political conditions and intermittent armed conflicts in several countries bordering Zambia (e.g., Zimbabwe, Namibia, Angola, and Zaire) have resulted in the influx of refugees in some regions. The addition of these displaced persons further stretches the limited health services available in the more remote regions.

7. Mental Health

In societies undergoing rapid modernization and urbanization, about one percent of the population usually requires some form of psychiatric treatment. Accurate statistics in which different patterns of mental disorders may be identified are not available. Many persons with severe psychiatric problems are treated by traditional healers, and those whose behavior is excessively violent will be held in local hospitals or prisons rather than sent to mental institutions. There is a trend towards an average prevalence of 12 admissions into psychiatric units annually per 10,000 population. Table 11 summarizes some of the details of admissions and attendances at mental health facilities.

Table 11\*  
ADMISSIONS & ATTENDANCES  
TO MENTAL HEALTH INSTITUTIONS  
IN ZAMBIA, 1969 AND 1975

	1969	1975
Chainama Hills Hospital Admissions	900	1,346
All Mental Health Units, Admissions	3,815	5,497
Prison Admissions	330	349
Psychiatric Outpatient Attendances	8,212	12,443
Psychiatric Outpatient Registrations	1,110	1,834

\* Haworth, Dr. A., and Dr. P.C. Msoni. Mental Health Services in Zambia

Incomplete MOH statistics indicate that for 1975 there were 809 cases of epilepsy, 192 of suicide and self-inflicted injury, 487 of alcoholism, 61 of senility, 323 of cerebrovascular diseases, and a total of almost 6,600 ambiguously defined cases. An analysis of a sample of 2,000 case records from the Chainama Hills Hospital reveals the following distribution of disorders:

- o Schizophrenia (16%)
- o Paranoid states (5%)
- o Other psychoses (36%)
- o Depression (12%)
- o Anxiety (7%)
- o Other neuroses, alcoholism and epilepsy (16%)
- o Other types (8%)

The above and other data appear to indicate that the pattern of mental disorders in Zambia is generally similar to that seen in other Southern African countries.

## B. HEALTH DELIVERY SYSTEM

### 1. The Organization and Administration of Health Services

The President of the Republic appoints the Minister of Health who serves as the political head of the Ministry. In addition, the President also appoints a Minister of State of Health who assists the Minister of Health. The chief executive and administrative officer of the Ministry of Health is the Permanent Secretary. The three administrative components of the Ministry (MOH) are:

- o Central Administration;
- o Provincial Administration; and
- o District Co-ordinating Committees.

a. Central Administration

This level is responsible for formulating health policy, comprehensive program planning, issuing policy implementation guidelines, and allocations of funds. The Central Administration is broadly divided into three areas: medical services, preventive services, and administrative services. The professional and technical divisions are coordinated by the Director of Medical Services. Each division is headed by an Assistant Director of Medical Services (ADMS). The divisions and their functions are:

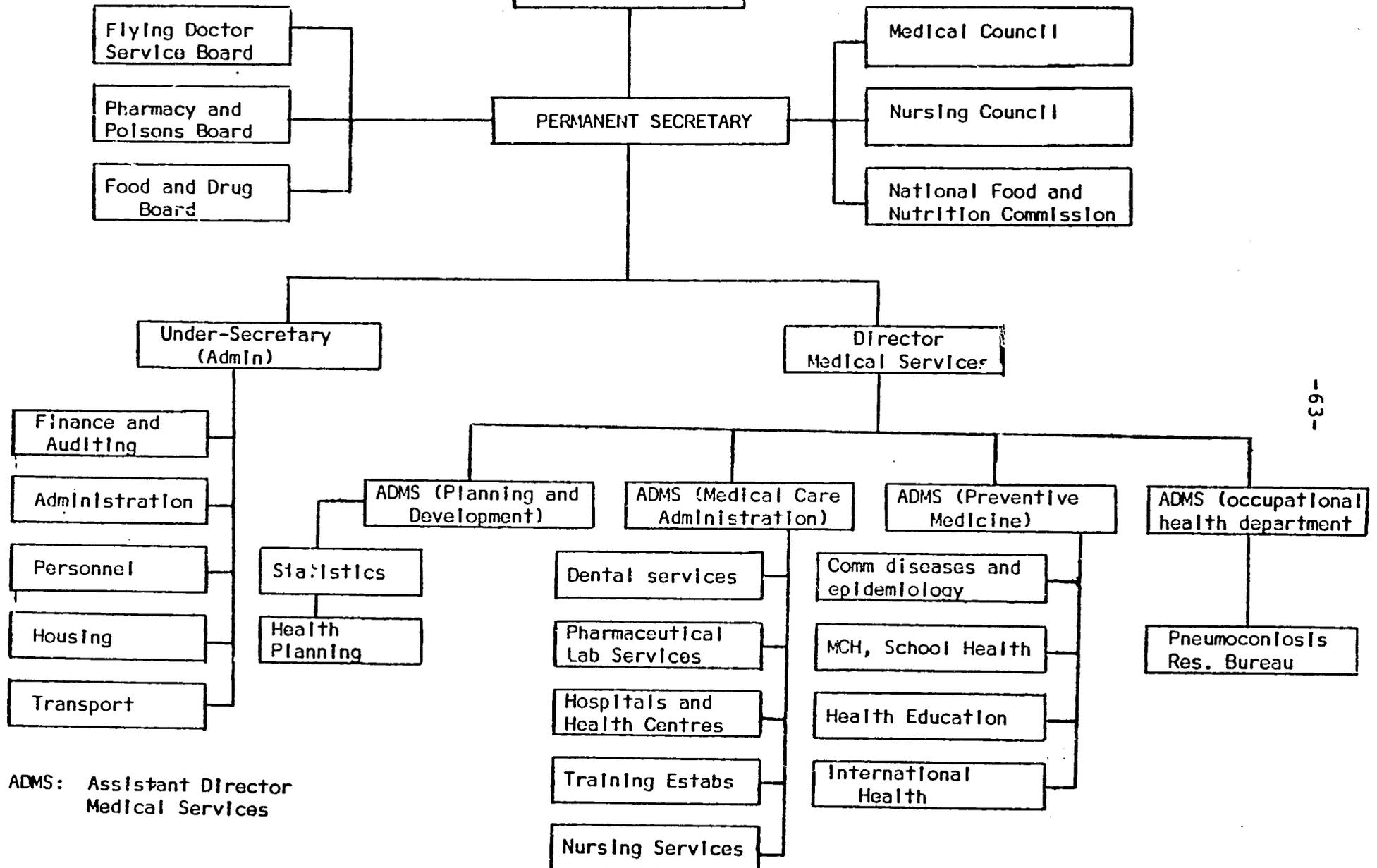
- o Medical Care Administration - Supervision and coordination of hospital activities, the pharmaceutical unit, dental services, laboratory services, and nursing services.
- o Planning and Development - Planning, evaluation, and creation of new health service projects. A statistical unit is part of this division.
- o Preventive Medicine - Responsible for the control of communicable diseases, international health, environmental health, epidemiology, MCH, nutrition, and health education.
- o Occupational Health - Responsible for health and safety matters in large industry, primarily the mines.

It should be noted that of the four ADMS positions two are vacant and one was about to be vacated at the time of the SADAP team's visit. Further, staffing depth is

ORGANISATIONAL CHART OF

MINISTER  
MINISTER OF STATE

THE MINISTRY OF HEALTH



ADMS: Assistant Director  
Medical Services

such that these vacancies mean there is serious understaffing at the Ministry of Health in critical professional areas.

The general administration of the MOH is under the supervision of an Under-Secretary and deals with transport, housing, finance, and internal audit, in addition to general administrative activities.

At least nine organizations are linked to the MOH and are involved in matters ranging from training standards and registration of health professionals to the control of drugs. They are:

- o Medical Council;
- o Nursing Council;
- o National Food and Nutrition Commission;
- o Pharmacy and Poisons Board;
- o Food and Drug Board;
- o Flying Doctor Service Board;
- o Zambia Red Cross Society
- o Pneumoconiosis Board; and
- o Medical and Pharmaceutical Corporation (MEPCO).

The Medical Council is made up of individuals appointed by the Minister of Health in consultation with various professional organizations. They deal with professional standards of training, practice, and ethics of physicians and para-medics, and appear to have considerable influence on health policy, including resource allocation. Priorities

of this group in previous years have concentrated on the development of a first-rate medical training program and establishment of the University Teaching Hospital (UTH). The Nursing Council functions in a similar manner with regard to nurses.

The Food and Nutrition Commission is primarily a research unit, although it has a new demonstration project and now aspires to a larger, more direct service role. The Medical and Pharmaceutical Corporation (MEPCO) is one of the twelve subsidiaries of the Zambia Industrial and Mining Corporation (ZIMCO). It coordinates policy in regard to the manufacture, importation, exportation, and distribution of medical and pharmaceutical products. MEPCO controls three subsidiary companies: The National Drug Company, Medical Stores Limited and General Pharmaceuticals.

b. Provincial Administration

A substantial part of the administrative activities are decentralized. The other major functional administrative components of the MOH are: the provinces, the University Teaching Hospital in Lusaka, three specialized hospitals (leprosy, mental disorders, and children), and the general hospitals in Kitwe and Ndola. The hospitals are run by Senior Medical Superintendents who are directly responsible to the Central Administration.

Within the general constraints of MOH policy and available resources, Provincial Medical Officers (PMO's)

have a high degree of authority and responsibility for health programs and services. The Central Administration in Lusaka has very limited resources for supervision and must rely heavily on the skill and initiative of the PMO's. The PMO is assisted by a Public Health Nurse, a Principal Medical Assistant, and Provincial Health Inspector. At the district level, health services are the responsibility of the District Medical Officer (DMO) who is also in charge of the district hospital and responsible to the PMO. At all levels there are problems of supervision, supplies, and transportation.

All large cities and towns have health departments as part of their municipal services; on the average, 50 percent of their recurrent budgets are subsidized by the Ministry of Health. These departments are headed by a health/medical officer who has considerable autonomy within the broad policy guidelines established by the MOH. Major activities at this level include environmental sanitation, communicable disease control, and preventive services.

c. Co-ordinating Committees

Integrated health services committees have been established at the provincial level under the leadership of the PMO to coordinate health activities. These include representatives from all groups directly involved in providing health services, and from other branches of government whose activities impact on health (e.g., agriculture, land and

water resources, education). These committees are chaired by the District Governor. They review reports on programs of each sector, discuss problems and make recommendations on new projects. Committees with similar functions frequently exist at the lower administrative levels (districts and wards).

d. The Churches Medical Association of Zambia (CMAZ)

Established in 1970, the CMAZ is a registered body which coordinates church-related medical work with the MOH. Other activities of the CMAZ include contracts with overseas agencies, church representation on health committees, and assistance in the planning of health activities and allocation of resources. The CMAZ plays a major role in negotiating with the MOH for grant-in-aids and other financial assistance which the MOH provides to church-run health facilities and services. There are disagreements between CMAZ and the MOH center on what the former group considers to be inequities in the allocation of funds for patient services and salary support. In general, however, there is a strong desire among church-related medical establishments to continue and to expand their involvement in the delivery of health services and training of medical personnel in Zambia.

## 2. Overview of Manpower

Zambia has made significant progress in increasing the number and kinds of health personnel and in the Zambianization of all but the highest level positions. Training and educational programs have been established for most categories of personnel and the standards of the medical, nursing, and mid-level professional staff are similar to those in developed nations. Table 12 gives some idea of the growth of major categories of health manpower since 1966. The number of health professionals in Zambia has more than doubled in the past eleven years but there is still a large demand for all types of health workers.

Three of the major health manpower issues are: an overall shortage of trained personnel; a low percentage of Zambians in senior professional and technical posts; and an uneven distribution of medical, nursing, and mid-level practitioners.

### a. Physicians

The ratio of physicians to the total population is about 1:8,000. In the rural areas, where over 66 percent of Zambians live, there are only 78 physicians (an approximate MD/population ratio of 1:41,000). In urban areas the ratio of MDs to the population is 1:3,400, but the figure is misleading since, at the University Teaching Hospital alone, there are more than 150 doctors and specialists. However,

Table 12  
PARTIAL GROWTH  
OF SELECTED CATEGORIES OF HEALTH PROFESSIONALS  
IN ZAMBIA, 1966 - 1977

Category	1966	1970	1977*
Physicians	329	527	643**
Nursing Staff (all categories)	703	2,106	4,280
Medical Assistants	435	918	1,030
Public Health Inspectors	56	80	115
Health Assistants	-	-	415
TOTALS	3,046	3,631	6,438

\* Includes data from mine facilities; previous years do not.

\*\* Includes 50 estimated to be in private practice.

these figures include interns and residents, a number of whom are not Zambians.

Zambian citizens make up only 10 percent of the country's physicians, 11 percent of its dentists, and 7 percent of the pharmacists (see Table 13). The training of Zambians for senior health positions is a government priority but will necessarily take a long time. In the interim, these posts are filled by expatriate staff, many of whom are from India and Pakistan.

b. Mid-Level and Front-Line Workers

The nurse/population ratio is 1:1,200 but more than 70 percent of the nurses work in urban settings, leaving the rural areas with a severe shortage. Because of the high need and demand for MCH services, this is a serious problem.

In regard to medical assistants (MAs) and health assistants (HA's), the problem is more one of overall shortage than maldistribution. Some existing health centers function without a fulltime medical assistant and few have the minimum required number of MA's, HAs and Zambia enrolled nurses (ZENs) or Zambia enrolled midwives (ZEMs). Only about half the rural health centers have a health assistant and only a small percentage have full-time nursing staff. A rough assessment of the current manpower situation is that at this moment the number of senior professionals, nurses, MA's and HAs are between 50 and 75 percent of those needed

Table 13

PROFESSIONAL, TECHNICAL, AND AUXILIARY HEALTH WORKERS\*  
IN ZAMBIA, 1975 AND 1977

Category	Public & Private, 1975		Government, Mission & Mine, 1977**
	Total	% Zambians in Total	
Physicians	643***	10%	596
Dentists	28	11%	17
Pharmacists	126	7%	40
Nurse Tutors (Nurse Educators)	19	16%	32
Midwifery Tutors	-	-	10
Nurse Administrators	36	47%	40
Public Health Nurses	-	-	10
Registered Nurse/Midwives	905	48%	1,740
Enrolled Nurse/Midwives	1,530	100%	2,540
Medical Assistants	980	82%	1,030
Health Inspectors	91	80%	115
Health Assistants	219	100%	415
Physiotherapists	16	19%	23
Laboratory Technicians	70	29%	132
Laboratory Assistants	60	100%	83
Radiographers	40	50%	72
X-Ray Assistants	40***	-	58
Dental Technicians	45***	-	10
Dental Assistants	18	100%	26
Health Aides (Dressers)	880	100%	900****
TOTALS	5,746		7,889

\* The decision was made to present data from two sources [20 and 31] since both sources are considered reliable and time is not available to account for differences.

\*\* Figures in this column are those being used by one MOH in planning its manpower requirements through 1983 (Reference 20).

\*\*\* Figures for 1977 (it includes estimate of 50 MDs in private practice).

\*\*\*\* Estimate.

SOURCES: 1975 - (31); 1977 - (20)

to provide basic services in those facilities already in operation.

i. Nurses

Several levels and categories of nurses are found in Zambia:

Zambia Enrolled Nurses (ZEN) are women who have completed at least two years of secondary education and a two-year training program;

Zambia Enrolled Midwives (ZEM) - ZEN training with an additional year of midwifery training or a two-year course;

State Registered Nurses (SRN) - completed secondary education plus a three-year nurse training program; and

State Registered Midwives (SRM) - SRN training plus one year midwifery training.

In addition, there are nursing positions as administrators, tutors, and as psychiatric and public health nurses. Almost all nurses are either in urban areas (in all types of facilities) or in hospitals in rural areas. Only a small percentage are full-time staff members of rural health centers.

ii. Medical Assistants

A medical assistant (MA) is trained and functions as a mid-level primary care practitioner. They are required to have completed at least two years of secondary education plus a three-year training courses. They provide curative

services for common illnesses, diseases, and wounds and are trained to refer more complicated cases to physicians. They participate in preventive programs in MCH, nutrition education, hygiene, and communicable diseases. They also have administrative responsibilities for the rural health center.

They are the principal front-line workers at rural health centers and usually work closely with a health assistant. While they are formally under the supervision of a physician (usually the Provincial or District Medical Officer), they function with a high degree of autonomy. Observations by the SADAP team and comments by health professionals in Zambia indicate that MA's are a dedicated, well-trained, and over-worked group. The health centers for which they are responsible are very much in need of additional staff supplies and transportation. Increased supervision and continuing education opportunities could also help improve their effectiveness.

iii. Psychiatric Medical Assistants

This is a small group of medical assistants who receive two years of psychiatric training (along with psychiatric nurse students) and have one additional year in clinical training. They serve as front-line mental health workers and are responsible for preventive as well as diagnostic and therapeutic services. This program may be integrated with the overall medical assistants programs.

iv. Health Assistants - Health Inspectors

Health assistants (HA) are front-line, mid-level health promoters who deal primarily with public health issues. These include: environmental health, the control and prevention of infectious diseases, and health education. Most HA's work as a team with an MA at a rural or urban health center and visit homes, neighborhoods, and villages. They deal with specific issues as: latrine construction and use, construction and maintenance of safe water supplies, the inspection of markets and food establishments, and immunization programs. HAS work under the supervision of a health inspector. Like the MAs, the HAS usually have inadequate supplies, transport, and supervision.

Health inspectors supervise the work of health assistants and are directly involved in the planning and monitoring of large scale projects such as immunization campaigns, water systems and disease control projects. At the provincial and district levels they work closely with the PMOs and the DMOs.

v. Other Front-Line Workers

Employees of other ministries (especially those of Community Development, Rural Development, Education, Land and Water Resources, and Agriculture) are involved in development activities which impact on health status. There are local (ward) and district committees in which ideas and programs

are shared and coordinated. There are many districts where the level of cooperation is good and integrated programs can be implemented.

Traditional Healers - The SADAP team was unable to validate any information gathered about traditional healers; most people interviewed claimed there were large numbers practicing and it appeared traditional medical beliefs and local healers are major factors influencing the health behavior of Zambian citizens in urban as well as rural areas. Furthermore, a recent study [7] shows that even trained health workers (MAs, HAs, Nurses) and teachers accept some traditional beliefs in areas of maternal-child health, infectious diseases, and nutrition.

There are a large number of types of traditional healers in Zambia, including herbalists, spiritualists, fetish priests, diviners, and cult healers. Some in urban areas adopt the title of "doctor" or "professor." [19]. It is difficult to estimate the number of these healers in Zambia, but it is reasonable to assume that there is at least one for each 1-2,000 inhabitants, that is, between 2,500 and 5,000 traditional practitioners. This figure does not include the number of traditional midwives found in every village and town. Some traditional midwives are now receiving formal training by government health personnel and are referred to as "traditional birth attendants" (TBAs).

Several informants on the subject of traditional healers suggested that even in areas where people had access to health workers, most individuals would consult or be treated by traditional practitioners before visiting a government health facility. This is especially true in rural areas and among the less educated, but is not restricted to these groups. The government has begun a dialogue with some traditional healers, and the MOH, UNICEF, and WHO sponsored a workshop on traditional medicine and its role in primary health care in Zambia [19]. If the MOH could develop an effective relationship to a large number of these practitioners, it would have a tremendous potential for improving the health status of the population.

### 3. Types of Health Services

#### a. Curative Personal Services

The vast majority of Zambia's health resources are devoted to curative and personal health. This includes between 80 and 90 percent of all services provided by the health professional, para-professional, technical, and auxiliary staff. The major providers of modern curative services are the physicians, dentists, nurses, and medical assistants. These services are delivered primarily in hospitals and health centers run by the government, the mines, and the missions. There are also traditional healers and numerous part-time village midwives whose services

are primarily of a curative and personal nature. There are approximately fifty physicians in private practice.

Some pharmacists function in a manner which would allow them to be classified as providers of personal health services, but no data are available on the scope and scale of their activities.

b. The Flying Doctor Service (FDS)

This service was founded in 1965. The FDS maintains 16 airstrips and has full responsibility for staffing and servicing 15 FDS clinics. Eleven other government or mission-run facilities are served regularly by FDS flights. FDS operates with six physicians and 12 Zambian enrolled nurses, most of whom have had midwifery training. One nutritionist also works with the service.

The FDS has four twin-engined planes and averages over 2,000 hours of flying time a year. It operates 24 hours a day and in 1976 the FDS made 345 emergency flights. In addition to curative services, it runs clinics for vaccinations, maternal and child health, health and nutrition education, and visits schools, as well as providing direct support to remote rural hospitals. The FDS is not yet fully integrated into the MOH but should be within the next few years. Though reportedly expensive, it is at present perhaps the only way of reaching remote regions until the MOH expands its standard services. (see Table 14).

Table 14

## MEDICAL SERVICES OF FLYING DOCTOR SERVICE

## ZAMBIA

Year	MD Visits to Clinics	Patients Seen		Inpatient Days	Patients Flown to Hospital	Immunizations
		Medical	MCH			
1975	1,535	221,586	4,034	23,928	1,352	32,375
1976**	1,336	184,514	4,560	20,097	1,126	19,060*

\* Decline from 1975 due primarily to 8,000 decrease in the number of polio immunizations.

\*\* Estimated expenditures were K820,000 for all activities.

c. Zambia Red Cross Society

The Red Cross has five chapters and about 30,000 members (adult and junior). They provide first-aid training and are available to assist in providing emergency care and participate in preventive programs.

d. Mental Health Services

This category of services utilizes several types of health manpower and provides curative and preventive services at Chainama Hospital and at about ten other hospitals. In 1975 there were 12 registered psychiatric nurses, 79 psychiatric medical assistants, 44 enrolled psychiatric nurses, and 16 psychiatrists and doctors engaged in mental health services. Traditional healers are being incorporated into these services on a trial basis. A Mental Health Association exists as a citizen support group and assists in promoting community awareness, prevention, and rehabilitation of discharged patients.

e. Preventive Services

Health inspectors, health assistants, midwives, and public health nurses are the major providers of preventive services to the population. Others, including some medical consultants, physicians, nurses, and laboratory/x-ray technicians, are also involved in preventive activities for varying amounts of time. Approximately 20 percent of the time of Zambia's professional, para-professional, and

technical manpower are directly involved in public and preventive health activities. However, a review of morbidity statistics reveal that major morbidity causes are related to situations, some of which can be effectively and efficiently dealt with through preventive programs such as measles, malnutrition, and gastro-intestinal disorders. Although 20 percent is a substantial allocation of time to preventive health services, given Zambia's morbidity and mortality status an increase of at least 10 percentage points to 30 percent merits serious consideration.

Zambia has a wide range of preventive and public health programs which utilize various configurations of health workers and which operate in urban and rural areas primarily through the health centers. These are described in "f"- "i" below.

f. Maternal-Child Health Services (MCH)

MCH clinics have recently been expanded to provide coverage to children up to 14 years of age and operate in rural and urban facilities. Activities include: immunization against communicable diseases, weight assessment, health and nutrition education to mothers, and distribution of food supplements. In addition, there are extensive ante-natal and post-natal programs which report high rates of participation even among women who do not use the facilities for delivery. It should be noted, however, that illnesses of

pregnant women, mothers, and/or children are often the primary reason for a visit, during which they will also participate in a preventive program. Family Planning services are provided on request in some facilities, but only a few centers distribute contraceptives. The demand for family planning services and contraceptives appears to be low and limited to major urban centers. The issue of family planning is controversial and outright birth control as a national policy is rejected. Child spacing is accepted.

Information on family planning and support for these programs are being promoted by a voluntary organization, The Family Planning and Welfare Organization of Zambia.

The MCH service also has responsibility for the School Medical Service and provides screening and medical examinations, vaccinations and medical treatment. Success of this program is minimal outside of major urban areas, generally because of staff and supply shortages, logistics and the lack of transport.

g. Vaccination and Immunization Campaigns

Vaccination and immunization against communicable diseases usually involve all facilities but are coordinated and carried out through special programs assisted by W.H.O. and UNICEF. Special units are required because existing facilities do not have the transport, refrigeration, and

supplies need to provide adequate coverage. The campaigns, carried out twice annually, have a 1980 goal of immunizing 80 percent of the under-14 population against seven communicable diseases--smallpox, measles, polio, diphtheria, whooping cough, tetanus, and childhood tuberculosis.

h. Sanitation and Environmental Health

Health inspectors and health assistants have primary responsibility for sanitation and environmental improvement. The improvement of water supply and waste disposal (sewage and latrines) are major activities but there is a serious lack of manpower, equipment, and supplies. Until more personnel and support funds are available the efforts to improve environmental conditions will be mostly ones of maintaining services already available and responding to emergency situations.

i. Health Education

The MOH has a health education unit to plan, promote, and evaluate activities in this field, which are carried out by existing professional and para-professional staff.

j. Supervision

Supervision of front-line, mid-level health workers is insufficient. PMO's and DMO's presently have responsibilities at hospitals which limit their ability to visit health centers. Even when time is available, transport problems make it impossible for Senior Medical Officers and Senior Medical Assistants to visit outlying centers. Furthermore,

many physicians do not seem to view support and supervision of MAs and HAs as an integral part of their job, and do not utilize the limited opportunities to improve the knowledge and skills of the non-physician practitioners.

k. Referral System

Referrals are not a major problem in urban areas nor at health centers which receive frequent physician visits or are close to hospitals. Where long distances are involved, the lack of transportation prevents a referral system from operating. The lack of ambulances, even in urban areas, limits the effectiveness of emergency services.

l. Laboratory Services

Laboratories operate in conjunction with medical facilities. Public health laboratories at UTH, Ndola, and Kitwe support environmental, occupational and preventive services and are used for training. Specialized laboratories exist for malaria, tuberculosis and food and drugs. Laboratories which do diagnostic work in parasitology, haematology, urology, biochemistry, and bacteriology function in the major urban, mine and provincial hospitals. Smaller district hospitals and some health centers have limited facilities to perform basic blood and stool evaluations. Except for the major urban and mine hospitals, laboratory facilities are in need of improvement and trained staff.

It should be noted that a major issue related to health manpower and services is the serious lack of trained staff, especially in rural areas. Case loads of the front-line health workers in health centers and clinics are very high, with some small facilities averaging between 80 and 150 patients per day at certain times of the year. This leaves little time for outreach, and personal preventive/education activities, and limits the role of many health workers to administrators/pill providers/injectors. The lack of adequate equipment, supplies, supervision, and transportation reduces the effectiveness and efficiency of most health workers.

#### 4. Overview of Facilities

Hospitals, clinics and rural health centers are the major health facilities in Zambia. They are run by the government, the missions, and the mines, and there are a few private clinics.

##### a. Hospitals

Hospitals are those facilities with a fulltime physician which provide medical and surgical services. They are classified according to the following categories:

- o Special Hospitals (3). One for leprosy, one for mental disease, and one for children.
- o Central Hospitals (3). The University Teaching Hospital (UTH) which covers almost all specialties, and those in Ndola and Kitwe which have most basic specialties. "Central" and "Special" hospitals are under the direct administration of the MOH headquarters in Lusaka.

- o General Hospitals (9). Located in the provincial capitals and at District headquarters in Chomb and Mbala. They provide major specialties of general surgery, gynecology and obstetrics.
- o District Hospitals (30). Located in district headquarters and serving as referral centers for small facilities in the district. Missions run 9 of the 30 district hospitals. All but five administrative districts are covered by hospitals.
- o Hospitals (34). Refers to all other hospitals provided by the government mines and missions that do not fall into one of the previously mentioned categories. The government runs 4 of these, the missions sponsor 19 and the mines are responsible for the other 11. In addition to a special leprosy hospital there are 5 government leprosaria and 12 run by missions.

The development of health facilities since independence has emphasized the growth of hospitals; in 1975 79 were functioning (81 in 1976). The following tables summarize selected data on the increase of hospitals and their capacity to provide in-patient services.

Hospitals are concentrated in urban and "semi-urban" areas and are heavily staffed, compared to those in rural areas. Table 17 shows some of the imbalance, although one must take into account the training and specialized services provided by larger hospitals.

##### 5. Health Centers

The basic health facility in Zambia is the health center, and this is the level for which support is most needed. There are two types of Rural Health Center. RHCs provide essential curative and preventive services including

Table 15  
MEDICAL FACILITIES, ZAMBIA, 1964-1975\*

Year	Hospitals					Health Centers & Clinics					Grand Total			
	Govt	Mission	Mine/ Other	Total	# of Beds/ Cots	Rural Health Centers		Clinics		Total	# of Beds/ Cots	Fulltime Institu- tions	# of Beds/ Cots	Lepro- saria
						Govt	Mission	Govt	Mine/Other					
1964	19	19	10	48	7,710	187	63	39	17	306	3,140	354	10,850	30
1965	20	20	10	50	8,330	194	61	38	18	311	3,440	361	11,770	30
1966	22	20	11	53	8,750	207	64	52	20	343	3,810	396	12,560	32
1967	23	20	11	54	9,210	223	71	64	22	380	3,860	434	13,070	30
1968	27	23	12	62	9,970	251	72	68	28	419	3,970	481	13,940	24
1969	28	26	12	66	10,550	276	75	75	38	464	4,080	530	14,630	22
1970	33	26	13	72	11,520	299	76	80	46	501	4,220	573	15,740	21
1971	33	27	13	73	11,910	339	79	89	49	556	4,390	629	16,300	20
1972	36	28	12	76	12,870	360	79	106	50	595	4,530	671	17,400	19
1973	38	29	11	78	13,100	371	76	130	49	616	4,600	694	17,900	18
1974	39	29	11	79	13,600	388	74	132	49	643	4,800	722	18,600	17
1975	39	29	11	79	14,990	404	74	141	51	670	4,990	749	19,970	17

\* Excluding Armed & Police Forces and Private Practitioners.

Source: Tables on Monthly and Mortality in Health Institutions, 1975.

Table 16<sup>4</sup>  
DEVELOPMENT OF HOSPITAL SERVICES, ZAMBIA\*  
1964 - 1975

	1964	1969	1975
Government Hospitals	19	28	40
Mission Hospitals	19	26	28
Mines Hospitals	10	12	11
TOTAL	48	66	79
Population (millions)	3.5	4.1	4.8
Number of Beds	7,710	11,919	14,980
Beds/1,000 Pop.	2.2	2.9	3.1

\* Excludes mines which are all in urban areas.

Table 17

DISTRIBUTION OF GOVERNMENT HOSPITAL SERVICES, 1976  
ZAMBIA

Location of Hospital	% Pop Resident	% Beds & Cots	% MDs	% Nurse Staff
Urban & Semiurban	35	55	85	72
Rural	65	45	15	28

Source: (28)

MCH, nutrition, and immunization clinics. The number of health centers has more than doubled since 1964. In 1975 there were 670 health centers run by the government, the missions, and mines. More than two-thirds are located in rural areas (see Table 18).

A Stage I Health Center is supposed to serve a population of 5,000-10,000 people, and a Stage II facility from 30,000-40,000 inhabitants. Rural health centers ideally cover about 1,250 square kilometers. The ideal staffing patterns of health centers are presented below. The actual staffing patterns fall far short of what is needed and suggest that priority should be given to adequate staffing and support for existing facilities rather than their expansion into new areas.

Health Centers: Ideal Staffing Pattern

	Stage I (2-4 Beds)	Stage II (16 + Beds)
Senior Medical Assistant	-	1
Principal Medical Assistant	1	2
Health Assistant	1	1
ZEN or ZEM	1	1
Dresser	1	1

At present most facilities lack the minimum staff needed, and rarely do rural centers have fulltime ZENs or ZEMs. About two-thirds of the Rural Health Centers have no health assistant. In view of the key role of MCH and other preventive programs, the shortage of female staff and HAs at

Table 18  
GROWTH OF HEALTH CENTERS  
IN ZAMBIA, 1964 - 1975

	1964	1971	1975
Rural Health Centers	250	418	469
Urban Health Centers & Clinics	56	138	201
TOTAL	306	556	670
Total Number of Beds	3,140	4,390	4,990

Source: (1)

these facilities is a serious obstacle in implementing these services.

a. Coverage

Hospitals and health centers are located in places where populations are concentrated. However, in view of the fact that the population density in rural areas is about 4 per square kilometer, the problem of access is obvious and exacerbated by a very deficient transportation system. Estimates based on 1972 data indicate that about 62 percent of the rural population is covered by existing facilities and that between 200-300 additional centers need to be constructed to cover the remaining widely scattered inhabitants.

b. Mental Health Facilities

The principal mental health institution is the Chainama Hills Hospital with over 500 beds. There are mental health units in 9 or 10 other facilities (mostly hospitals), with about 500 additional beds. A Rural Mental Health Settlement functions in Nsadzu for long-term patients. An undetermined number of mentally disturbed individuals are in prisons rather than mental institutions (estimated number: 1,000).

6. Laboratory Facilities

a. Specialized Laboratories

There is a malaria division laboratory in Lusaka (entomological investigation and blood examination).

A chest diseases laboratory is used as a central and reference lab for tuberculosis diagnosis.

b. Public Health Laboratories

These are found at UTH and central hospitals in Kitwe and Ndola. All of these are supervised by pathologists. There is a Food and Drug Laboratory at UTH.

c. Major Hospital Laboratories

UTH, Kitwe, and Ndola provide a full range of facilities for clinical and pathological investigations and are used for diagnosis, reference, and training. They are run by professional pathologists and other specialists.

d. General Hospital and Specialized Laboratories

Intermediate-level labs run mostly by laboratory technicians are found at most provincial and mine hospitals.

e. District-Level and Health Center Laboratories

District-level hospitals have basic laboratory facilities and are generally run by laboratory assistants. Some health centers have laboratory equipment with the work done by the medical assistants.

The intermediate level of laboratories is most in need of improvement. There is a general shortage of qualified laboratory personnel.

7. Pharmaceutical Products

Pharmaceutical products consumed most frequently are antibiotics, ointments/creams, syrups, and injections. Drugs supplied to facilities that do not have a physician in residence appear to be carefully selected and appropriate to the morbidity patterns. Almost all medical and surgical supplies are imported, as are more than 90 percent of the pharmaceutical products. In 1975 over 3,000 different products were supplied by more than 50 importers, and the annual rate of consumption increase is estimated to be between 10 and 15 percent. There are shortages of essential drugs, especially in the smaller facilities.

A drug compounding plant in Lusaka presently supplies less than one eighth of the country's requirements. It is, however, being expanded. An intravenous fluids plant is also being built in order to save costs of delay and transportation.

8. Manpower Training

Zambia has training schools for fifteen major categories of health personnel and an increasing number of specialized programs within several professional, para-professional, and technical fields. In 1977 there were 18 training institutions for enrolled nurses (ZEN), 9 for enrolled midwives (ZEM), 4 for state registered nurses, and one each for the other categories of health personnel. The number of

students enrolled in these programs is between 2,300 and 2,500 including about 50 non-Zambians (mostly in the medical school). The total output of these facilities was over 930 in 1975 and over 1,000 in 1977. Nurses and midwives account for 85 to 90 percent of the output (see Table 19).

a. Physicians

Physicians are trained at the School of Medicine of the University of Zambia (begun in 1968), which has a close working relationship to the University Teaching Hospital. In 1977, 23 students graduated from the school; the proportion of Zambian nationals enrolled is between 65 and 75 percent. The Third National Development Plan calculates that by 1983 the University Teaching Hospital will have trained about 170 Zambian physicians.

b. Nurses

The majority of nurse training schools are run by the government, although some are operated by mission and mine hospitals. Specialty training is available for nurses in administration, health education, nursing education, psychiatry and ophthalmology (see Table 20).

c. Para-Professionals

The training programs for medical assistants, psychiatric medical assistants and health assistants were, until 1978, administratively independent. Now they are run as departments at the Chainama Hills Training Center and are working towards greater integration and coordination of staff and

Table 19  
HEALTH PERSONNEL TRAINING ESTABLISHMENTS, ZAMBIA  
INTAKE AND OUTPUT, 1975/1977

Staff Category	Training Schools/ Programs 1977	Annual Input 1977*	# of Students 1975	Output 1975 (1977)
Physicians	1	25	156	11(23)
State Registered Nurses	4	270	508	195 (184)
State Registered Midwives	1	78	48	40 (50)
Enrolled Nurses (ZEN)	18	540	963	410
Enrolled Midwives (ZEM)	9	200	194	177 (177)
Nurse Tutors	1	12	-	(?)
Medical Assistants	1	70	154	61
Health Inspectors	1	21	52	14
Health Assistants	1	73	115	37
Physiotherapists	1	16	21	4
Laboratory Technicians	1	24	33	7
Laboratory Assistants	1	14	22	10
Radiographers	1	20	6	5
Theater Technicians	1	-	-	-
X-Ray Assistants	1	6	-	-
Dental Assistants	1	9	-	-
Dental Technicians	1	5	-	-
Pharmacy Technicians	1	24	-	-

SOURCE: [32]

Table 20

NURSE TRAINING IN ZAMBIA  
1978

Category	Prerequisite	Length of Training
State Registered Nurse (SRN)	Complete Secondary	3 Years
State Registered Midwife (SRM)	SRN	1 Year
Public Health Nurse	SRM	9 Months
Zambia Enrolled Nurse (ZEN)	2 Years Secondary	2 Years
Zambia Enrolled Midwife ZEM (1) ZEM (2)	ZEN 2 Years Secondary +	1 Year <u>or</u> 2 Years

curriculum. Minimum requirements for MAs and HAs are two to three years of secondary education, but most applicants exceed the minimum and many are secondary school graduates. The program lasts for three years and combines classroom studies with clinical rotations and internships that are supervised. The MA program is three years long and the one for HAs is for two years. Demand for entrance into the programs is very high (between 5 and 10 applicants for each student accepted). The curriculum is well-developed and the faculty is well qualified. A major weakness is the lack of clinical experience in rural areas where most new graduates will work.

d. Health Auxiliaries and Technicians

The Evelyn Hone College of Applied Arts and Commerce in Lusaka trains medical laboratory technicians, radiographers, dispensers, physiotherapists, and health inspectors. All programs last for three years except for the program for dispensers, which lasts for two years. Laboratory assistants are trained in Kitwe, Ndola, and Chikankata Salvation Army Hospital. There are intermittent training programs for traditional birth attendants.

9. Overview of Financing

a. Ministry of Health

Since 1972 health services have been made available at no cost to the Zambian population and include facilities and services operated by the MOH, the mines, and the

missions. Services cover non-citizens as well as Zambians. The following tables provide some details of government expenditures.

From 1965 to 1976 the recurrent expenditure of the MOH was between 6 and 7 percent of the total government expenditure. The level of per capita expenditures is among the highest in Africa (see Tables 21 and 22 ). In addition to the MOH costs, one must take into account the recurrent costs met by the mines and missions. Precise figures are not available, but a conservative estimates of the additional mine and mission expenditures would be from 15-20 million Kwacha and possibly higher. That would result in a total recurrent cost of between 62 million - 67 million Kwacha for health in 1977.

Table 23 provides breakdowns on recurrent and capital expenditures of the MOH. The University Teaching Hospital (UTH) in Lusaka absorbed 17 percent of the 1977 recurrent budget and about 20 percent of the capital expenditures. Based on actual 1976 expenditures, the UTH and the two central hospitals accounted for 31 percent of the recurrent budget. For the same year 57 percent of the recurrent budget went to the support of the provincial and district hospitals, urban and rural health centers, grants to the mission hospitals, categorical preventive programs, offices of the PMOs, the Flying Doctor Service, the public health laboratories, and a portion (52%) of costs of the three

Table 21

CENTRAL GOVERNMENT & HEALTH MINISTRY EXPENDITURE, ZAMBIA  
RECURRENT EXPENDITURES, 1965 - 1977

Year*	Total Central Government (K000)	Health (K000)	% of National Expenditure	Per Capita Expenditures on Government Health Svcs.**
1965/66	139,383	8,725	6.3	2.4
1966 (July-Dec)	76,930	4,701	6.1	2.5
1967	212,675	12,231	5.8	3.2
1968	225,690	14,788	6.6	3.7
1969	233,231	16,806	7.2	4.1
1970	274,989	20,052	7.3	4.7
1971	350,306	24,148	6.9	5.5
1972	363,122	25,848	7.1	5.8
1973	394,111	28,226	7.2	6.1
1974	440,913	31,758	7.2	6.9
1975	580,991	36,948	6.4	7.4
1976 (Budget)	618,881	42,781	6.9	8.3
1977 (Budget)	633,120	47,254	7.5	8.9

\* Year ended June up to 1965/66 and December thereafter.

\*\* Government expenditure only.

NB: LZK = U.S.\$1.57 before July 1976  
LZK = U.S.\$1.26 since July 1976

Source: (41)

Table 22  
CENTRAL GOVERNMENT & HEALTH MINISTRY EXPENDITURE, ZAMBIA  
CAPITAL EXPENDITURES, 1965 - 1977

Year*	Total Central Government (K000)	Health (K000)	Capital Health Expenditure as % of Total Capital Expenditure
1965/66	65,669	1,092	1.7
1966 (July-Dec)	40,925	785	1.9
1967	119,426	3,270	2.7
1968	193,325	4,769	2.5
1969	156,272	4,524	4.2
1970	239,332	7,178	3.5
1971	202,607	5,446	2.7
1972	160,367	5,847	3.7
1973	388,152	3,165	0.8
1974	193,772	3,475	1.8
1975	245,570	4,548	1.9
1976 (authorized)	135,272	6,433	4.9
1977 (budget)	159,424	5,039	3.2

\* Year ended June up to 1965/66 and December thereafter.

Source: Various government publications.

Source: (43)

Table 23  
RECURRENT AND CAPITAL BUDGETS  
(APPROVED ESTIMATES)  
ZAMBIA MINISTRY OF HEALTH, 1977  
(KWACHA)

	Recurrent	Capital	Total
Headquarters	9,537,555	862,000	10,399,555
Provinces	19,382,100	2,928,999	22,310,100
UTH	8,419,750	1,049,000	9,468,750
Ndola Central	3,780,050	200,000	3,980,050
Kitwe Central	2,995,990		2,995,990
Specialist Hospitals (3)	2,626,200		2,626,200
Public Health Labs	182,800		182,800
Pneumoconiosis Medical & Research Bureau	329,400		329,400
TOTAL	47,253,845	5,039,000	52,292,845

Source: Estimates of Revenue & Expenditure, 1 January 1978 - 31 December 1978.

speciality hospitals.\* A categorical breakdown of budget allocations is found in Table 24.

Capital expenditures for MOH headquarters (K862,000) includes: K180,000 for the Flying Doctor Service, K180,000 for Medical Stores, K100,000 for ambulances, and K200,000 for the Kabwe Demonstration Zone. The latter is a special model project for health service delivery and will also be used by students in various health worker training programs. Capital expenditures to provinces are used to support hospitals, health center repair and construction, nurse training schools, and living accommodation.

b. Mines

All services and capital costs for facilities run by the mines are fully supported by them. They also do some training of nurse and auxiliary health workers. They provide some services to the non-mine employees in the areas they cover. The mines spend between 13 -15 million Kwacha annually on health services.

c. Missions

Missions provide a substantial percentage of health services in Zambia. In 1976, for example, the "approved" mission beds were 29 percent of the total; the actual percentage was higher as many mission beds are not "approved" for

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\* The listing of costs making up this 57% may have omitted grants to local health authorities in support of public health activities.

Table 24

Categorical Expenditures by Ministry of Health, Zambia  
Approved Estimates, Recurrent Budget, 1977

(Millions of Kwacha)

Budget Subheads	MOH HDQ.	Pro- vinces	Univ. Teach. Hosp.	Ndola Cent. Hosp.	Kitwe Cent. Hosp.	Spe- cialist Hosp.	Public Health Labs	Pneum. Med/Res. Bur.	Totals*
Personal Emoluments	1.43	10.51	4.28	1.87	1.70	1.03	0.15	0.17	21.14
Grants, Subsidies	5.72	-	-	-	-	-	-	-	5.72
Grant/Aid Missions	(4.0)								(4.0)
Grant/Aid/Local Authorities	(0.5)								(0.5)
Flying Doctor Service	(0.9)								(0.9)
Others	(0.32)								(0.32)
Recurrent Departmental Charges	2.37	8.87	4.14	1.91	1.30	1.60	0.03	0.13	20.35
General (Including travel and training)	(0.35)	(1.89)	(0.91)	(0.39)	(0.35)	(0.52)	(0.01)	0.13)	(4.55)
Prevention/Control of Disease	(0.53)	(0.21)	-	-	-	(0.02)	-	-	(0.76)
Supplies/Services to the Sick	(1.26)	(6.77)	(3.23)	(1.52)	(0.94)	(1.07)	(0.02)	-	(14.81)
Other Categories	(0.23)	-	-	-	-	-	-	-	(0.23)
<b>TOTALS*</b>	<b>9.54</b>	<b>19.38</b>	<b>8.42</b>	<b>3.78</b>	<b>3.0</b>	<b>2.63</b>	<b>0.18</b>	<b>0.30</b>	<b>47.2</b>

Source: (21)

\*May not add due to small residuals not listed.

government support. The MOH provides the mission facilities with grants-in-aid for salaries, beds, and capital expenditures. The amounts, however, are less than the actual costs, and the missions have to make up the differences and/or reduce the ratio of staffing to patients.

The MOH provides salary support at only the minimum level for each category. This ranges from K5,136 per annum for medical doctors to K660 per annum for dressers. All government employees receive annual increments and are paid according to years in service, thus it is up to the missions to provide salary supplements or lose personnel (most of whom they trained) to government or the mines.

The missions also receive K200 annually for each "approved" bed (about 4,500 in all), but their actual number is reported to exceed those approved for aid by 1,000. MOH grants-in-aid to mission facilities include 75 percent of capital expenditures and 100 percent of equipment costs. The major issue under continual discussion and negotiation between the missions (represented by the Church Medical Association of Zambia-CMAZ) is the financing of facilities and services.

#### 10. Donor Assistance

External assistance to Zambia plays an important role in the health sector. Between 85 and 90 percent of the physicians, dentists, and other highly trained professionals are non-Zambians. Many pharmacists, registered nurses, and midwives are also citizens of other countries. A large

proportion of expatriate personnel is on direct contract with the MOH and subject to conditions similar to those of Zambian employees. The government does, however, place a high priority on the Zambianization of health professionals, although this will take many years to accomplish at the top level.

The amount of foreign assistance in the health sector amounted to about 8 percent of the MOH's recurrent budget in 1975 and 1976. Donors supplied about 225 trained health personnel to Zambia in 1975 and 1976 (see Tables 25 and 26).

TABLE 25

Donor Assistance: Bilateral and Multilateral (in \$USA)

	<u>Total all Sectors</u>	<u>Estimated to Health Sector</u>
1975	33 million	3.6 million
1976	43 million	4.3 million

a. Multilateral Assistance

This assistance covers the training of health personnel, advisors, medical training, disease control and eradication, nutrition, health legislation and research in tropical diseases. A center in Ndola will serve as a major facility for the WHO Special Programme in Research and Training in Tropical Diseases. This program will begin in Africa but will extend worldwide. Other multidonor assistance has been in the fields of population, health education,

TABLE 26

Externally-Financed Health Projects (Amounts in US \$)<sup>44</sup>  
In Zambia, 1978

	Project/Activity	Source	Funds 1976	Duration Begin-End	Type of Aid
	1. Development of Health Services	UNDP/WHO	174,090	1973-78	Advisors & fellowships, MCH/Biostatistics/Epidemiology
	2. Health Education	UNFPA*/WHO	30,000	1972-79	Advisor
	3. Development Basic Health Services	UNICEF	100,000	1975-77	MCH, paramedical training, supplies, transport
	4. Assistance to Country Health Programs	WHO	64,500	Ongoing	Services of WHO representative to assist planning, etc.
	5. Training Health Personnel	WHO	150,200	Ongoing	Four expert advisors/public health, community medicine/training
	6. Fellowships	WHO	26,000	Ongoing	For training Zambians overseas
	7. Under-Five Clinics	WFP**	145,000	1974-79	Food supplements, transport
	8. Senior Lab Technician	CFTC***			
	9. Doctor, Nurse Tutors	Austria	20,000±?	1975-79	To provide training, health services
	10. WHO Medical Research Center	Belgium	60,000	Ongoing	Contribute to center & subscriptions
	11. MCH Workshop	Czechoslovakia	40,200	Present	Physicians (specialists), medical equipment technicians
	12. Health Care	Denmark	190,000	Ongoing	Trainers, volunteers, curative & preventive fields
	13. Water Supply - Lusaka	F.R. Germany	(774,764)	1975-78	Water management & supply study
	14. Health Professionals	France	10,000	1974 -	Four MDs
	15. Nursing	Ireland	N/A	Ongoing	Nurses to health institutions
	16. Physicians	Italy	15,000	1974-76	Two volunteer doctors
	17. Hospital Improvement	Netherlands	(598,900)	Ongoing	Expansion, renovation two hospitals
	18. Health Personnel	Netherlands	249,200±	Ongoing	Services of MDs, nurses, training & environmental health
	19. Health Personnel	Sweden	1,179,000	1974-78	Personnel for health planning, training MCH, volunteers
	20. Health Personnel	USSR	N/A	Ongoing	25 MDs to hospitals
	21. Health Personnel	UK	N/A	1976 -	22 medical specialists, 9 medical officers, 3 dentists, 21 pharmacists, nurses & others
	22. Training Fellowships	UK	N/A	1976 -	7 fellowships for training in the UK
Bilateral Assistance Projects Grouped by Country	23. Mangango Leprosarium	American Leprosy Assn	811	Ongoing	Salary to administrator
	24. Medical Report	CODEL****	3,500	1976 -	Publishing cost/health services report
	25. Kalabo Leprosy Hospital	IEPRA	3,150	1976 -	Outpatient control program
	26. Leprosy Center	Lep. Relief Wk.-Emmaus	7,344	Ongoing	Financial aid - Lukulu, W. Prov.
	27. Health Clinics	Pilgrim Wesleyan Ch.	N/A	1976-77	Five nurses
	28. Hospitals	SIBU/SIDA*****	(673,000)	1974-77	Health professionals, hosp construction
	29. Hospital	Services From Overseas	N/A	1976 -	Services of nurse
	30. Clinic Construction	Un. Church of Canada	N/A	1976 -	Grants for clinics
	31. Blind/Lepers	White Fathers	18,000	1976 -	Gifts for Leper colony/school for blind

- \* UNFPA: United Nations Fund for Population Activities  
 \*\* WFP: U.N. Children's Fund  
 \*\*\* CFTC: Commonwealth Fund for Technical Cooperation  
 \*\*\*\* CODEL: Coordination in Development  
 \*\*\*\*\* SIBU: Scandinavian Independent Baptist Union  
 SIDA: Swedish Assistance Agency

maternal-child health, food supplements, equipment and supplies to hospitals, health centers, and training institutions.

b. Bilateral Assistance

Bilateral aid has been important in maintaining and developing Zambia's health services. Great Britain plays a major role by topping off salaries to U.K. nationals recruited to work with the government as physicians, nurses, administrators, and in public health, nutrition, and research. Sweden has supplied nurses, a physician, and funds for nurse training, health planning, and the planning and construction of rural health centers. Other European nations have supplied volunteers and some specialists. The USSR has provided 30 doctors to Zambia since 1970. Belgium has aided the training center for medical assistants and health assistants at Chainama Hills. Several governments have provided scholarships for training abroad.

c. Non-Governmental Organizations

About a dozen church-backed organizations from the U.S.A., Canada, and European countries provide considerable support to the mission hospitals in Zambia.

d. Related Aid

In addition to aid allocated specifically for health activities, other assistance in fields such as agriculture, food production, population, education, housing, water supply, and transportation has impact on health status.

IV. ISSUES OF CURRENT CONCERN

A. Zambia's Health Plans: General Objectives

Health planning in Zambia has been incorporated into three National Development Plans which have dealt with all major areas of health and medical services, training, and research. Officially, the Third National Development Program (TNDP) was scheduled to begin in January 1978, but it is still in draft form and is being adjusted to current problems and financial constraints. Zambia's current needs should be viewed as combining goals and priorities from both the second and third National Development Plans.

Zambia has made excellent progress in developing an effective health service in a relatively short period of time. A major problem appears to be the striking of a reasonable balance in future resource allocations between curative and preventive services, and between urban and rural facilities.

The overall objectives of the Party and the government are to improve and expand health services to cover all areas of the country and to maintain the present policy of providing these services free to all people in Zambia. These objectives are to be met by improving and expanding primary and environmental health services through integrated programs, especially in the rural areas. The specific strategy adopted by the government for the Third National Development

Program reflects the goals and policies stated above, but adapts them to financial and manpower constraints.

The TNDP objectives are:

- o the continued development of an effective and integrated national health care system;
- o the development of basic health services in rural areas, priority being given to those areas where no such facilities exist;
- o the attainment of higher levels of Zambianization through expanded training programs; during the TNDP the distribution of workers will be carefully examined;
- o movement toward complete integration and expansion of curative services;
- o provision of health protection to an increasing number of mothers, infants, school children and certain vulnerable categories of workers;
- o decentralization of basic health services;
- o the nutritional well-being of the population, with particular attention to vulnerable groups.\*

In view of Zambia's overall economic situation, it is unlikely that the MOH will have substantial funds to both maintain current levels of services and training and expand rural and preventive facilities and programs. The government has, however, set priorities for the completion and implementation of certain types of programs. These are:

- o Uncompleted projects in the Second National Development Plan (mostly funds to the Provinces to complete construction and improvements for hospitals, health centers and training institutions);

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\* Children under 14, women of child-bearing age.

- o Projects which will help in solving Zambia's man-power problems;
- o Projects that contribute to integrated social and economic development programs in specific localities and;
- o Projects and programs using low-cost technology and maximizing efficiency in the use of all types of resources.

A summary of health investments planned in the TNDP is shown in Table 28.

1. Coordination of MOH Policy and Programs with Other Agencies (Public and Private).

More effective use of existing resources can be achieved through administrative changes and through more effective planning and cooperation between the Ministry of Health and other development agencies in the public and private sector. The TNDP calls for such cooperation between the MOH and the following areas:

a. The Church Missions

Zambianization of personnel, and more complete integration into the national health service.

b. The Mines

Better coordination of services provided by MOH institutions and those run by the mines.

c. Community Action Programs

Including those for water, sanitation, and construction of community health centers.

d. School Health Services

Closer ties with existing MCH services. Also, expanded training of traditional birth attendants.

e. Industry

Occupational health programs with companies that have 200 employees or more. This will include large-scale farms and agro-industries.

Table 27

HEALTH INVESTMENTS (CAPITAL EXPENDITURES) PLANNED FOR ZAMBIA  
IN THIRD NATIONAL DEVELOPMENT PLAN, 1979 - 1983  
(In Thousands of K)

A. Carryover projects (Subtotal A)	12,832
B. New Projects & Programs	
1. UTH	6,000
2. Training Institutions	1,500
3. National Health Laboratory	300
4. Flying Doctor Service	250
5. Ambulance, Specialist Vehicle, Boats	800
6. Hospital Improvements, Minor Works	300
7. Cold-Chain Stores	500
8. Provincial & District Hospitals	25,100
9. Rural Health Centers*	-
10. Church Hospitals & Health Centers*	-
SUBTOTAL B	34,750
+ SUBTOTAL A	12,832
TOTAL	47,582

\* These expenditures come from Provincial Capital Grants.

## 2. Preventive Health and Nutrition Services

Increased emphasis on health education at the community level; environmental sanitation and hygiene; improved housing; expanded immunization programs; stricter surveillance and quarantine measures; regulations for more effective quality control of food and drugs; and more effective enforcement of regulations. Other changes include:

- o adding nutrition education to all health training programs;
- o in-service, nutrition training to all para-medical staff and district public health officers;
- o the employment of public health nutritionists and dietitians;
- o measures to protect against blindness caused by Vitamin A deficiency; and
- o other food supplements directed primarily to children, and pregnant and lactating mothers.

## 3. Hospitals and Health Centers

Improving and consolidating existing structures and the construction of new district hospitals and rural health centers are planned. The TNDP calls for an expenditure of almost 13 million Kwacha to complete capital projects begun during the Second National Development Plan period. Over K10 million will go to the provinces for hospitals and training facilities. New capital projects for the TNDP are outlined below, and again the largest share will go to the Provinces for hospitals and rural health centers. The patient capacity of hospitals and health centers is expected to increase

from 19,800 in 1977 to 21,760 in 1983--a 9.9 percent increase.

#### 4. Transport

A major problem which cross-cuts many sectors including health is the lack of transportation. Every official contacted, from administrators in central headquarters to medical assistants in rural posts, indicated that transportation was inadequate. The transportation issue can be broken down into several interrelated problems:

- o the lack of routine preventive maintenance of vehicles (checking oil, fuel, electrical system; lubrication; changing or cleaning air, oil, fuel filters) and the lack of capability of ministries to make simple repairs eg. tune-ups, brake pad replacement, etc.
- o insufficient numbers of vehicles, especially at the provincial and district levels, and over-dependency on automobiles as opposed to motorbicycles and bicycles;
- o the lack of spare parts (complicated by the many different makes of vehicles);
- o the lack of trained vehicle mechanics; and
- o the extraordinary long periods of time taken to repair vehicles (from several weeks to more than two years).

The importance of adequate transportation can be seen by examining the following list of activities all of which depend on good transportation.

- o Supervision at all levels;
- o Referrals of emergency and seriously ill patients to hospitals;
- o Supply of drugs and other medical stores; and

- o Administrative coordination and interagency cooperation.

Even without any other changes in the health system, improving the transport capabilities of medical and health officers would contribute to more effective services.

5. Training and Research

a. African Traditional Medicine

The government will explore research possibilities in areas related to traditional medical beliefs, practices, and the role of healers. The aim is to evaluate these traditional systems through research, and to determine the most effective ways of incorporating the positive aspects into national health services.

b. Environmental Health/Infectious Diseases

Research on parasitic diseases (malaria, trypanosomiasis, shistosomiasis, filariasis, and leprosy) will be carried out in collaboration with W.H.O. and other international organizations. A major Tropical Disease Research and Training Center will operate out of Ndola and will serve as a resource for all Africa.

c. Health Statistics

The present unit will be transformed into a Statistical Information Unit and additional intermediate and senior level staff will be trained. This is a high quality operation and at present suffers tremendously from a lack of clerical and logistical support. If other parts of the TNDP are to be effectively implemented, up-to-date information is

necessary and can be provided by this unit if it receives adequate funding.

d. Manpower Training

Training of medical, nursing, and paramedical personnel in Zambia and abroad will continue to receive priority. The goal is Zambianization of training for nurses and paramedical workers. The medical school at the University of Zambia is expected to increase its enrollment of first-year students to 45 by 1981, and to be graduating between 35 and 40 physicians per year. Zambian doctors as a percentage of the total is to change from its current 10 percent level to 36 percent by 1981. Dentists will continue to be trained abroad, as will pharmacists (although this may change). For most categories of health workers, Zambia will continue to have a health manpower shortage even if the TNDP goals are met. Table 28 summarizes the projections and plans of the MOH.

In addition to the physicians, dentists, and pharmacists which Zambia will continue to recruit from outside the country, other categories of health workers will remain in short supply. Senior level nurses trained as educators, public health specialists, administrators, and additional registered nurses will be needed. There will also be a serious lack of an adequate number of medical assistants, health assistants, lab and x-ray assistants, and of other types of allied health manpower.

TABLE 28  
ZAMBIA MANPOWER REQUIREMENTS, 1979 - 1983  
(GOVERNMENT + MISSION + MINE) \*

<u>CATEGORY OF STAFF</u>	<u>STRENGTH 1977</u>	<u>ADDITIONAL T.N.D.P. REQUIREMENT</u>	<u>OUTPUT ESTIMATED IN T.N.D.P.</u>	<u>SHORT FALL</u>
1. Doctors	596	464	170	294
2. Dentists	17	74	-	74
3. Pharmacists	40	66	-	66
	<u>653</u>	<u>604</u>	<u>170</u>	<u>434</u>
4. <u>Nursing Staff</u>				
a. Education General (Reg. Nursing Tutors)	32	120	80	40
b. Public Health Nurses	10	180	90	90
c. Nursing Admin- istrators	40	120	40	80
d. Minwifery Tutors	10	36	20	16
e. State Registered Nurses/Midwives	1,740	2,170	1,610	560
f. Zambia Enrolled Nurses/Midwives	<u>2,540</u>	<u>5,275</u>	<u>4,760</u>	<u>515</u>
	<u>4,372</u>	<u>7,901</u>	<u>6,600</u>	<u>1,301</u>
5. Medical Assistants	1,030	1,050	375	675
6. Public Health Inspectors	115	64	60	4
7. Physiothereapists	23	75	30	45
8. Health Assistants	415	480	320	160
9. Laboratory Technicians	132	74	60	14
10. Laboratory Assistants	83	150	60	90
11. Radiographers	72	35	75	+40
12. X-Ray Assists	58	92	25	67
13. Dental Technicians	10	35	10	25
14. Dental Assistants	26	164	125	39
15. Pharmacy Technicians	31	140	100	40
	<u>1,995</u>	<u>2,359</u>	<u>1,240</u>	<u>1,119</u>
Total	<u>7,020</u>	<u>10,864</u>	<u>8,010</u>	<u>2,854</u>

\* These figures are from the MOH and may vary slightly from other statistics used in other portions of this report.

V. RECOMMENDATIONS

Ministry of Health Staff in Lusaka and the Provinces appear to have a clear grasp of the major problems and needs of the health system. The major issue, debated at the highest level of the ministry, is the relative allocation of resources among those who view health care as primarily a curative service that requires fully trained physicians and specialists, and those who give priority to preventive/ environmental services and the expansion of primary care using medical assistants and nurse midwives. At a policy level, the Third National Development Plan sets down goals and policies which seek to provide a better balance among services and are oriented toward further expanding preventive approaches and community based primary care. In view of the anticipated fiscal situation, however, it would be unrealistic to encourage expansion before facilities in operation or under construction are more adequately staffed and supplied. Thus, the principal recommendation of the team is that assistance be directed towards maximizing the effectiveness of current facilities and staff.

The following are recommended areas for external donors to consider in providing assistance to Zambia.

A. INFRASTRUCTURE SUPPORT

The extraordinary shortage of foreign exchange, coupled with growing difficulties in recruiting and maintaining expatriate personnel, and the certainty that sufficient

Zambian manpower will not be available for at least a decade to fill senior and highly skilled mid-level technical positions, all suggest that the massive investment made by the Zambian government in the physical health infrastructure may, in substantial part, be compromised unless external donor assistance is directed toward maintenance of the existing physical facilities and equipment.

What are the consequences of not maintaining this infrastructure, including the urban hospitals? If it is allowed to degrade, the inevitable first priority for rebuilding will be the urban hospital capacity. In ten years the costs for rebuilding and renovating will be prohibitive. It is highly unlikely that additional funds for this rebuilding and expansion of rural and primary care services will be available. Therefore, in order to maintain and improve the nearly balanced investment that Zambia has made in health, it is appropriate and even crucial, to provide support to the existing delivery system.

It is possible, in 10-15 years, that the economy will be more diversified and less dependent on copper, that Zambianization of manpower will have taken place, and that the country will be in a position to provide the full operating costs of skilled personnel to maintain the existing system, as well as to invest in progressive extension of services to the needy and the underserved throughout the country.

If these developments do not take place, it may with near certainty be foreseen that scarce resources will be used in the next ten years to inadequately maintain the urban hospital capacity, which will slowly deteriorate while the rural capacity will more rapidly worsen. As the economy recovers, the priority for new investment will be focused at the urban centers, with parallel long-term, perhaps irreversible, setbacks to rural and preventive services.

Recommendation:

Budget support and expatriate technical assistance personnel should be provided to assist the Zambian government in maintaining the existing hospital, laboratory, and clinic infrastructure for the next five to ten years, until sufficient Zambians are trained and the Zambian economy can recover sufficiently to make external budget support and expatriate personnel unnecessary. (See also recommendations for personnel which follow).

B. SENIOR AND MID-LEVEL MANAGEMENT AND TECHNICAL PERSONNEL

At independence Zambia was reported to have had less than one hundred university graduates. Given this serious manpower handicap, the effectiveness of government management and planning since then are truly remarkable. At the same time, there remains in the Ministry of Health extreme dependency on expatriate personnel, with a serious lack both of Zambian physicians trained in public health and preventive medicine, and of Zambian non-physician planners and managers who can function at both mid- and senior-levels.

Recommendation:

1. Support manpower training and development programs that have as their first priority the development of a cadre of non-physician, and physician managers and supervisors. Utilizing Zambian teachers, augmented as necessary by qualified expatriates, most of this training could be done in-country in two or three intensive sessions of several weeks duration, interspersed with assigned reading and other work which could be undertaken while the trainees have returned to their regular jobs. During the time Zambians are being trained, external assistance may be needed to recruit expatriates and to supplement salaries to fill critical positions in the Ministry of Health.
2. Support the planning and development of capability to train senior- and mid-level management and technical personnel in-country.

C. ALLIED HEALTH MANPOWER

Health auxiliaries and medical assistants, as well as state registered nurse/midwives, or some other class of worker who will be accepted by the population, both rural and urban, all need to be substantially increased in number to improve the effectiveness of current facilities and programs. The general curriculum approach for medical auxiliaries and health assistants seems well-developed. There are serious problems in the transport of trainees to the sites for clinical training, inadequate teaching staff for supervision on site, and inadequate opportunity for continuing education of mid-level workers once they are graduated and at work. The medium-term goal should be increasing the capacity for training and supervision of

workers, such that the existing rural and urban health centers are staffed within 5 years to the level at which they were originally planned operate.

Recommendation:

1. Support an assessment of the needs for allied health manpower within the context of the government's development plan and priorities for the health sector.
2. When the quantitative needs are established, support expansion of training capacity and, as appropriate, modification of curricula.

D. TRANSPORTATION

The efficiency of both preventive and curative health services in Zambia is critically hampered by the gross inadequacy of the transportation system. There are too few vehicles available to transport patients, supplies, and workers, and those that are tend to need repair or are generally inoperable.

Assistance to Zambia in any sector must give careful consideration to its dependency on improved transportation. There is an obvious general need for the development of skilled manpower who can be retained in government vehicle repair sections, or for the development of contracts with qualified privately-owned repair centers. The lack of repair equipment and spares must be remedied so that vehicles can be repaired and goods and services can move throughout

the country. The general improvement of transport capacity can make a significant contribution to improved accessibility to health services.

Recommendation:

An assessment should be made of the health sector's transportation needs. Analysis and assessment should focus on the three major aspects of the problem: (1) the unique needs of the government health services that are best met by motor vehicles under Ministry of Health control and for which the Ministry is responsible for maintenance and repair; (2) the needs of the health sector that can be met by joint use of a government-wide motor pool, and by general improvements in the transportation sector as a whole (public and private); (3) the feasibility of reimbursing Ministry staff, particularly at the village and provincial levels, for their use for official purposes of privately-owned cars, motor bikes and bicycles, which they would be assisted in purchasing.

E. MALARIA

A number of factors are currently at work in Zambia that dramatically increase the likelihood of a serious upsurge in malaria. These factors are:

- o shortages (and occasionally total lack) of chloroquine, the principal drug used for the suppression and treatment of malaria;
- o shortages of insecticides used in the control of the mosquito vector;
- o the reported increase in incidence of malnutrition (which makes one more vulnerable to malaria);
- o the cessation of organized, country-wide malaria control activities; and
- o the reduction of endemicity of malaria in urban areas, which has reduced the acquired immunity of large parts of urban populations and made them more susceptible to malaria.

All these factors acting together have raised the probability of rapidly increasing morbidity and mortality due to malaria. It should be noted that the malaria strain that is widespread throughout the country is the most lethal form, plasmodium falciparum.

Recommendation:

A qualified team of malariologists should be constituted to determine the extent of the threat of an upsurge of malaria and, in the event a serious threat is confirmed, to plan a short-term control strategy which might reasonably include:

- o assured delivery of sufficient stocks of chloroquine to allow high-risk individuals to receive routine suppressive doses through existing health facilities;
- o delivery of insecticides and appropriate spray equipment, probably focusing on control activities in areas where population density is reasonably high;
- o strengthening the central malaria laboratory services at Chainama Hills Hospital;
- o planning for the training, employment, and supervision of sprayers and related malaria workers;
- o arranging for emergency provisions for the physical distribution of chloroquine and insecticides to areas where they are needed; and
- o consideration of interim distribution mechanisms that would avoid the serious constraints imposed by the current inadequacies of the transportation system.

F. RURAL DEVELOPMENT AREAS AND EXPANSION OF HEALTH SERVICES

New clinic or hospital services should only be supported by donors if they are in areas designated by the government for integrated rural development. The rationale for introducing new services to these areas is to increase the

attractiveness of these agricultural and community development areas, to assist the government in providing incentives in order to curb rural-to-urban migration trends, and to strengthen the possibility of the successful development of an agricultural base in order to decrease dependency on imported foods and contribute to overall economic self-sufficiency.

Recommendation:

If the government can afford to expand health services after giving priority to maintaining and improving service in the current health care facilities, donors should restrict assisting expansion of health services to areas designated by the government for integrated rural development.

G. PERI-URBAN SQUATTER AREAS

A number of peri-urban squatter areas exist in and around Lusaka, Ndola, Kitwe, and other urban centers. These settlements have sprung up largely unplanned, are densely populated, have insufficient space for subsistence cropping, are seriously underserved by basic health services, and have inadequate water supply and sewage disposal facilities. Some of the squatter areas are served by standpipes. In the areas visited, latrines which were used were quite shallow. The problems of overcrowding, poor drainage, shallow latrines, absence of safe water, greatly overstressed primary care services, poor access to staple foods, and

generally low incomes all contribute to the people being at the high risk of disease.

It should be noted that the team, in visiting two such areas, was struck by the sense of community coherence and strength of community/party organization. It may be that this strength plus intensive efforts by families to maintain their homes, however humble, in a clean and neat condition, explain so far the absence of serious epidemics in the squatter areas. This is a thin and over-stretched defense against disease, which is bound to be breached from time to time. However, the strength of the party structure at the local level should be fully exploited in health improvement schemes in these areas.

Recommendation:

Identify as precisely as possible the population and boundaries of all peri-urban squatter areas. For each area, categorize the presence and absence of basic services, particularly water supply, sewage disposal, immunization and disease control measures, including malaria suppression for high-risk groups, maternal and child health services, food supplies and nutritional status, and housing adequacy. Based on a settlement by settlement assessment of need, develop specific programs targeted at reducing risks.

H. MEDICAL SCHOOL

The strengths of the medical school in Zambia are quite remarkable. However, as can be said of most medical schools in the world, the relevance of its curriculum can be

criticized as being too curative in its emphasis and as not giving due importance to primary care and to community and public health in the Zambian context. The school is accepting a small number of students who appear to be fully qualified to pursue training in medicine. Graduates, in substantial part, meet international standards of excellence in all major clinical and preclinical subjects. Outside examiners from England and the U.S. are used and students are held to the standards used by the outside examiners in their own disciplines in their own country.

Recommendation:

If Zambia would be willing to open its medical school to qualified students from other Southern African countries, donor support should be focused on the following areas:

- o supporting a modest expansion of its pre-clinical capacity (as its current clinical program can accommodate larger classes);
- o assisting in the recruitment of appropriate faculty, so that the quality of education can be maintained;
- o assisting in conceptualizing curriculum modifications so that the physicians' training may be more relevant to the people's needs, i.e. strengthening the primary care, community health and preventive medicine aspects of the curriculum with the requisite reorientation of the pre-clinical and clinical programs;
- o supporting the development of a clinical and field internship program in which medical students can be trained in primary care as well as hospital settings in order for them to learn how to delegate, supervise, and work with medical auxiliaries, nurse-midwives and health assistants; and

- o seeking ways to link the medical school, the World Health Organization (WHO) supported Research Center at Ndola and the WHO/Belgian/Dutch supported rural demonstration project at Mwachisompola in a manner that fully captures and capitalizes on these, as service delivery training and research resources.
- o seeking ways to develop long-term liaisons with universities in the U.S. and Great Britain, including but not limited to medical schools, encouraging faculty and student exchanges and collaborative research/teaching efforts.

#### I. MISSIONS' HEALTH DELIVERY

The mission hospital and clinic system is a strong and central part of rural delivery throughout Zambia. The return of the government's investment in the mission system is great. The missions are substantially subsidized from outside the country and many of the skilled expatriate services are provided at cost far below market prices. As the missions' health care facilities are well accepted by the people, consideration should be given to more fully utilizing them.

#### Recommendation:

1. Consider expanding the missions role in the training of auxiliaries and of medical students.
2. The missions' considerable managerial skills should be tapped to support Ministry operations, both centrally and provincially, during the next ten critical years. For example, in remote areas where a government rural health center is far distant from the offices of the District - Provincial Medical Officer it depends on, the missions might be requested on a reimbursable basis to provide supervision, logistical support (supplies, drugs, etc.) and continuing training to the center staff.
3. The missions' increasing difficulty in covering recurrent costs needs to be addressed soon by the

Ministry. Removing the current uncertainty about the Ministry's formulae for computing subsidies would permit the missions and the government to make plans more realistically for future activities, staffing, and capital investment.

J. URBAN WATER: LUSAKA

It was reported that the Lusaka water supply is generally safe; however, when the treatment plant, which is operating at capacity, must be shut down for maintenance reasons, untreated water is shunted around the plant directly into the distribution mains. If this is in fact the case, it represents, periodically, significant hazard to the areas's entire population.

Recommendation:

1. Verify the existence and extent of this problem, and, if warranted, assist in the planning and construction of a supplementary water treatment capacity.
2. Extend water mains to areas of the city not now being served as well as to areas where growth is planned by the government with the intent to serve as an incentive in the control and direction of future settlement patterns.

K. URBAN WASTE DISPOSAL

It was reported to the SADAP team that much of Lusaka is not provided with a sewage system. Large parts of the city are dependent upon sewage collection in buckets, with further collection by tank trucks. From time to time, this city of over 400,000 people is serviced by only two functioning tank trucks. The rapidly growing urban area of Lusaka while dependent on this form of waste disposal is

greatly increasing the risk of fecal contamination of water supplies and food stuffs, as well as the transmission of disease from feces to humans by insect vectors.

Recommendation:

Verify the need and, if external assistance is needed, assist in the planning and construction of a city-wide sewage improvement project, designed to meet the needs of Lusaka, at least through the year 2000.

L. PUBLIC HEALTH LABORATORIES AND ENVIRONMENTAL HEALTH

The Public Health Laboratory Program in the Public Health Laboratory, as well as the Malaria Control Service Laboratory, appear to be in great need of strengthening in terms of personnel and equipment. The degree of support of these laboratories should be seen in the context of an overall assessment of the health protection needs of Zambia and the development of an infrastructure that allows adequate health protection, management planning and implementation of management capacity within the Ministry of Health.

In addition, the environmental health infrastructure of the Ministry of Health appears to be generally underdeveloped and understaffed.

Recommendations:

1. Verify the need for equipment and personnel and, if external assistance is deemed necessary, assist in the training of professional, technical, and maintenance personnel, in the provision of equipment and assist in the development of a public health laboratory plan of operation which assures support of other Ministry of Health preventive and curative programs.

2. As an integral part of strengthening the management, planning, and administrative capacity, an assessment should be made of the medium- and long-term health protection needs of the country. Such an assessment should also address the organizational structure and staff development program which should be established within the Ministry to meet those needs at reasonable cost.

M. TRADITIONAL HEALERS AND BIRTH ATTENDANTS

In view of the large numbers of traditional healers and midwives, possible cooperation between the modern and traditional systems should be explored which might result in a low-cost, culturally appropriate strategy to improve the quality of health services. Results of research in this area could be useful to activities in health and nutrition, education, community medicine, and the training of health professionals.

Recommendations:

Research and pilot programs should be supported to explore effective means of cooperation between the modern and traditional systems of health care which would: (1) determine the extent and efficacy of traditional healers and birth attendants; and (2) develop ways of utilizing the positive aspects of their services and eliminating the harmful.

N. HEALTH STATISTICS

The well-conceived statistical unit within the MOH collects basic data needed by the Ministry for planning and evaluation. Due to a lack of clerical, administrative, and financial support, the contribution of this unit is less than it could be. A relatively small level of assistance

would enable this unit to analyze its data more rapidly and produce reports needed to monitor and evaluate the effectiveness of health services.

Recommendations:

The Ministry should review its allocation of clerical, administrative, and financial support to the unit.

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APPENDIX I

LIST OF PERSONS INTERVIEWED AND INSTITUTIONS VISITED

CENTRAL PROVINCE

Ministry of Health

Mr. Sikazwe, Permanent Secretary  
Dr. J.M. Kasonde, Director of Medical Services  
Dr. S.H. Siwale, Assistant Director of Medical Services  
for Planning  
Dr. W.M. Lungu, Assistant Director of Medical Services  
for Administration

Mr. P.C. Gupta, Senior Finance Officer  
Dr. L. Stein, Chief Statistical Unit

Mr. F.K. Mambwe, Chief Health Inspector  
Ms. Matanda, Chief Nursing Office  
Mr. J.S. Nyirenda, Chief Medical Assistant  
Mr. Gerald Moore, Chief Pharmacist  
Mr. Karl Alexanderson, Architect/Health Planner (SIDA)  
Dr. J.P. Chalimba, Acting Chief Medical Assistant

Deputy Secretary to the Cabinet

Francis Walleseku

Ministry of Economic and Technical Cooperation

Mr. E.S. Musande, Assistant Secretary

National Commission for Development Planning

Mr. David Simonda, Permanent Secretary

Ministry of Finance

Dr. R.K. Sharma, Under Secretary-Economics  
Mr. M.Z. Mfune, Accountant-Budget

Ministry of Labour and Social Services

Ms. Ima Kando, Director, Women's Program,  
Department of Community Development

Mechanical Services Branch, Office of the President

Colonel Fara, Director

National Food and Nutrition Commission

Dr. Vamoer

School of Medicine, University of Zambia

Dr. David Makulu, Dean

Staff Physician, Department of Community Medicine

Mr. S.L. Tembo, Principal Medical Assistant,  
Department of Community Health

Ms. Rosa Ndlovu, Director, Post Basic Nursing Programs

School of Nursing, University of Zambia

Ms. Zyongo, Principal Tutor

University Teaching Hospital

Dr. Carruthers, Senior Medical Superintendent

Dr. Agneta Magnusson, Medical Superintendent for  
University Health Centres

Dr. Mbwazi, Staff Physician and Administrator

District Health Inspector's Office-Lusaka

E.B. Siville, Registered Medical Assistant,  
National Immunization Campaign

Chainama Hills Training Centre

Dr. Jadau, Professor, Mental Health Program

Dr. Adi Kari, Professor, Medical Assistant Program

Mr. Ian Watson, Professor, Department of Environmental Health

Kamwala Health Centre

Mr. S. Wamulume, Medical Assistant Director

Kanyama Health Centre

Ms. C.A. Koudowe, SRN/SCM, Director

Ms. W. Gwanzura, SRN, Assistant Director

Kanyama Officials

Mr. C.D. Ngana, UNIP Leader

Mr. N. Kenengana, Ward Development Officer

Kabwe Rural Demonstration Zone Project

Mr. Ngoma, Assistant Project Director  
Dr. Naftali  
Dr. Felton  
Mr. L.W. Banda

Mwachisompola Sub Health Centre

Medical Assistant

The Churches Medical Association of Zambia

Michael Chesterman, General Secretary

Private Physician-Lasaka

Dr. John Billingslez

U.S. Embassy

Mr. John Hicks, AID Affairs Officer  
Mr. Richard Tierney, Political Officer

British High Commission

Ms. Catherine Downs, First Secretary of Development  
Mr. C.N. Seath, Development Assistant

World Health Organization

Dr. B.J. Sehgal, Representative for Zambia  
Mr. Clarence Hall, Health Education Director

Royal Swedish Embassy

Ms. Elizabeth Michanek, Senior Program Officer,  
Development Cooperation

SOUTHERN PROVINCE

Chinkankata Hospital

Dr. Paul Duplessis, Superintendent, Salvation Army

COPPERBELT PROVINCE

Provincial Medical Officer

Dr. V.R. Ganu

Kitwe General Hospital

Dr. Amin  
Ms. Stephenson, Matron  
Ms. Eva Sanderson, Chief of Nursing

Pneumoconiosis Research Bureau

Dr. Kelly, Director

Bureau of Mines

Mr. Banning, Chief Inspector

Ndola General Hospital

Dr. F.Y. Assanah, Acting Superintendent and  
Chief of Radiology

Assistant Commissioner, Community Development,  
Community Development Training College, Kitwe

Mr. G.D. Chellah

Nkana Hospital

Dr. Hugh Penry, Acting Superintendent

Zambia Flying Doctor Service, Ndola

V.R. Chelemu, M.D., Director  
Christopher Samendi, Medical Assistant  
Rural Health Facilities Visited Via the Service:  
Chichili Island Health Centre, Lake Bangweulu  
Santa Maria Hospital - Chilupi Island, Lake Bangweulu  
Mofu Health Centre

Thomson Hospital

Dr. R.J. Ratel, Superintendent  
Ms. C.S. Masabo, Matron  
Mr. G.B. Kamanga, Administrator  
Mr. Albert Kalaluka, Field Officer

Mikomtwa Health Centre

L.S. Singogo, Senior Medical Assistant

Kafulafuta Health Centre

Sister Gwen Chambers, N. Baptist Association of Zambia  
Sister Jane Moss, N. Baptist Association of Zambia

Mpongwe Hospital

Sister F. Anderson, Scandinavian Independent Baptist Union

NORTHERN PROVINCE

Provincial Medical Office

Dr. P.M. Patel

Provincial Medical Officer for Special Projects

Dr. Robert Hultberg

District Medical Officer-Mbala

Dr. Graham Kirk

Medical Officer

Dr. S.S. Mathur

Kasama Hospital

Mr. Nsakanya, Medical Assistant, Assistant Administrator

Mr. Paul Baker, Chief Pharmacist

Mation

Dentist

Mungwi Health Centre

Ms. E. Kondolo, Zambian Enrolled Nurse

Ms. R. Mulelo, Zambian Enrolled Midwife

Mr. Egondwe, Medical Assistant

Secondary School, Mungwi

Teacher

Ndasa Health Centre

Mr. P.M. Chileke, Medical Assistant

Mr. R. Chongo, Health Assistant